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NOT IN TIME.—We have received from Mr. H. C. Adams an abstract of the official report of tests, made by the Franklin Institute examiners, on the gas lamps exhibited at the late "Novelties" display. Owing to the pressure on our columns we are obliged to defer publication of the article until issue for January 2d. The showing made by the tests will be somewhat of a surprise, even to gas men.

AN APPEAL IN BEHALF OF THE HARTLEY FUND.

Since the first shock caused by the announcement of the sudden passing away of that distinguished member of the English gas fraternity—Mr. F. W. Hartley—has abated, a slight inquiry into condition of business affairs of deceased developed the fact that, contrary to general estimation, he was far from being in an easy financial position when death removed him from the scene of his labors. While this state of affairs would mean but little, under other circumstances, and which here need no explanation, the situation becomes really deplorable when the facts in the case, as it stands, are reported. Mr. Hartley's family, as mentioned by our English Correspondent, in his letter published in our last issue, consists of five daughters and three sons. Of these the two elder boys are in situations the income from which just about enables them to make a bare living; and, in view of their stipends, cannot be relied upon to contribute very largely towards the decent support of the others of their family. The youngest son is still a junior. The two elder girls require some slight amount of capital to properly equip them for the successful carrying on of a business the principles of which had formerly been taught them. The third daughter is a confirmed invalid, while the younger sisters are of too tender an age to expect any other treatment than that accorded to the infantile branches of a family. In view of this lamentable situation, and remembering that Mr. Hartley was in no sense a spendthrift or an improvident man—how could he be either when he so creditably reared such a large family on a mere salary; and, mind you, an English salary, too—we would ask that the American fraternity will endeavor to aid us in an attempt to raise a fair sum of money to be added to the fund (now in process of collection on the other side of the Atlantic) that is to be applied to the purpose of relieving the dead engineer's progeny from possible want. We ask your hearty response to this call, and not alone through charitable motives is the application made, for the deceased, through the medium of his ever ready pen, has placed the entire gas world under obligation to him. Indeed, no one can gainsay the fact that Mr. Hartley's name (and fame as well) is firmly established in the gas circles of America.

Those of our readers who may desire to subscribe to the American section of the Hartley fund can send their remittances to Messrs. A. M. Callender & Co., proprietors of this JOURNAL, and they will forward the same to Mr. W. H. Bennett, Secretary of the British Gas Institute, who has charge of the matter on behalf of your English confreres. A complete list of the donors, in their capacities as individuals or companies, will appear in our columns; and it is presumed that the final treasurer or custodian of the fund will furnish American subscribers with sheets showing the ultimate disposition of the moneys subscribed.

In conclusion, we have but to say that Messrs. A. M. Callender & Co. will contribute the sum of $25, and earnestly ask that due attention be given to the matters explained above.

SOME SURPRISING NEWS FROM ALBANY, N. Y.

In our "item" columns for August 3d mention was made of the fact that articles incorporating a new gas company for Albany, N. Y., were filed with the proper official on date of July 13th. The names of the incorporators were also given, as well as other information concerning the leading features of the scheme. At the time we ventured the prediction that if the newcomers were bent on blackmail, pure and simple, they would likely count

without their host, and based the assertion on the well-known firm financial standing enjoyed by the old Albany Gas Light Company. We must confess, however, that recent subsequent developments have evolved a surprising termination to the Albany affair.

The incorporators of the opposition, or—as it is called—Municipal Company, obtained, on Sept. 15th, after much contention, a franchise from City Councils to pipe the streets, and supply gas. Under its terms the company was to be ready to go on with construction work by first day of 1886, and begin the supplying of gas on or before the first day of 1887. The regular routine of bald lies was proceeded with in the attempt to hoodwink the press, and delude such members of the Council as were really honest into the belief that by favoring the designs of the Benedicts (people in the neighborhood of Tappan have heard of that suggestive Christian name before) the people of Albany were but paving a way to the road of cheap gas. The schemers bound themselves hard and fast by the agreement that they "shall not sell their corporate rights to any other gas company now in existence in this city, or to any gas company, person or persons, in a period of five years from January 1st, 1886." Matters dragged along for a couple of weeks or so without any particular ripple obtruding itself to mar the easy and sleepy existence so long enjoyed by the old Albany Company, when it suddenly appeared to the minds of the sleepers that a stroke of business in the shape of a haul could be done in one way or another, and "feelers" were accordingly thrown out in the proper direction. The unerring noses of the skilled opposition fry scented the bait, and seine pullers H. M. Benedict, of Brooklyn, and "Tony" Brady, of Albany, made their appearance. It was discovered that while the "Benedicts" of the first part could not sell out to the Albany Company, the combined Benedict representation was at perfect liberty to accept a proposition looking to the purchase of the "stock and good will" of the aforesaid Albany Company. "Barkis was willin'," and in consequence the matter resolved itself into a mere arrangement of "dollars and cents." When the directors had secured the consent of a majority of the shares (for we imagine the lesser shareholders had little to say about it one way or another), the details of the "deal" were concluded; and these seem to be as follows: The Municipal Company's agents agreed to pay the sum of $500,000 into the Commercial National Bank, on the first day of December, 1885—the deposit to be delivered to a committee representing the stockholders of the old Albany Company—in consideration of which the entire plant of the company, and all of its possessions (excluding surplus) was to be made over to the depositors of the money. The agents further agreed to deposit $250,000 (as purchase money, at par, of the entire capital stock of the Albany Company) as security that they would, on the first day of June, 1886, complete and pay for the said capital stock, which is to be delivered to them, "all and singular," on that day. The agents finally agree to purchase the large stock of coke, owned by the Albany Company, and pay for the same at the rate of four cents per bushel. To sum up the amounts that will be received by the holders of Albany Company's shares when the division is made: The old company is understood to have a surplus on hand of $650,000; to which add the $500,000 bonus for surrender of "good-will," plant, etc., and the $250,000 for par redemption of stock, besides amount chargeable to the coke portion of the "deal"—or a grand total of over $560 per $100 of stock.

In the meantime the Municipal promoters propose to increase their capitalization from $700,000 to $1,000,000; and the Albany idiots (or knaves) who granted the franchise to the schemers can figure out how the Albany gas consumer is to be benefited. Under the old regime that consumer was taxed to enable the Albany Company to pay a dividend return on a capital investment of a quarter of a million dollars; under the new order of things he will be taxed to the extent of paying at least 10 per cent. on a so-called investment of an entire million.

A MOST IMPORTANT DECISION.

Telegraphic advices of date of December 7th convey the announcement that the United States Supreme Court has rendered decision in the case of the Louisville (Ky.) Gas Light Company vs. the Citizens Gas Light Company, of same city; also in the case of the New Orleans (La.) Gas Light Company vs. the Louisiana Light and Heat Producing and Manufacturing Company.

It is matter for regret that the telegraph conveyed so meager an account of the text of the decisions; but it is also matter for congratulation that the highest legal tribunal of the country refuses to see through the glasses favored by the raiders on established gas properties. The Supreme Court holds broadly that gas purveyors, operating under instruments awarding them exclusive control of certain stated districts, for a certain stated term of years, are entitled to protection in such right; and that such instruments in no manner conflict with Constitutional law. We expect to publish, in due season, a complete report of the judgment rendered.

[Official Report—Continued from page 288.]

Thirteenth Annual Meeting of the American Gas Light Association.

Held at College Hall, Cincinnati, Ohio, Oct. 21, 22, 23.

First Day—Afternoon Session.—Wednesday, Oct. 21.

Joint Discussion on the Somerville-Spice Papers.

In calling for discussion on the subject submitted by Messrs. Somerville and Spice (see Journal, 2d inst.), President Vanderpool remarked that the members had just listened to two papers which were replete with interesting information. He expressed the hope that the discussion would be exhaustive.

Mr. Harbison—I would like to know whether the liming process is covered by letters patent.

Mr. Spice—It is patented in America.

Mr. Harbison—Would it not be possible to employ a lime material that did not carry so great a weight of water in it? In that event a great saving of fuel might be secured. Mr. Somerville makes a strong point of the increase in the cost of fuel in the carbonization of the coal. To put it in other words—could not dry or air-slaked lime be used, and thus secure the saving in fuel the increased expenditure of which Mr. Somerville found such an important item?

Mr. Spice—As to the inquiry whether we could not use the lime without its containing such a quantity of water, I might say that we should be then using somebody else's patent instead of our own; and it would also be open to the objection that the men would be smothered by the lime. Mr. Somerville has, in some way or another, misunderstood the exact *modus operandi*. In adding too slight a quantity of water he has, as one result, converted his stokers into millers, and covered his retort house interior with powdered lime. The use of the water is no drawback. We sell more coke than we did before; and instead of increasing our fuel for carbonization we reduced it. Of course, if that quantity of water pure and simple was thrown on the coal, and that wet coal was then put into the retorts, your heats would be materially brought down; but if you mix it with lime no inconvenience of that sort would be experienced.

Mr. Harbison—In that respect Mr. Somerville reports a different result from that detailed by Mr. Spice.

Mr. Spice—I do not know how Mr. Somerville tried his experiment; but my statement of experience is the result of two years' working.

Mr. Harbison—I am trying to get around the difficulties experienced by Mr. Somerville in his month's working. I infer from the remarks of Mr. Spice that that gentleman has conquered the difficulties as they were encountered; and as a consequence he does not now have them to contend with. As to Mr. Spice's remarks about everything being covered over with lime dust, I must say that I do not find, in our lime room (where we are using oyster shell lime), that the men get covered with it as a consequence of handling it dry. Would it be sufficient to take the specified quantity of lime and sprinkle it over the coal; or must it be thoroughly mixed with the rake?

Mr. Spice—We use a charging machine; and a part of that apparatus involves the use of a coal breaker. A man fills a barrow with coal, turns it over into the coal breaker, and then puts a shovelful of lime on top of the coal just as it is going down. That is all he has to do.

Mr. Harbison—Is it necessary to use oxide with the liming process?

Mr. Spice—That is not a hardship, but rather a blessing. It is not a necessity, but that is a part of the story. You use no lime except that which goes into your coke. Instead of the lime being sent away as useless when taken from the purifiers, it goes to market—you sell it with your coke. By reason of the lime addition the weight of your coke is increased 2½ per cent.

Mr. Harbison—If you were to sell the coke by measure there would not be an advantage?

Mr. Spice—There would be no money result gained therefrom, but the quality of the coke would be improved.

Mr. Harbison—In this country, I apprehend, coke is not generally sold by weight. If it were so sold there might perhaps be cause for serious reflection regarding the integrity of the seller. For instance, he might be accused of watering the coke in order to increase its weight.

Mr. Spice—Formerly all coke was sold by measure in England; but now we have an act of Parliament compelling its sale by weight.

Mr. Harbison—What effect has the liming process upon the life of the retort?

Mr. Spice—None whatever. That is the last thing to imagine. The first thing that we found any difficulty about was in the deposit of a dusty material in the flues of the furnace. This dusty deposit merged gradually into a hard substance that tended eventually to choke up the flues. We had to blow them out more frequently than was the case before.

Mr. Harbison—Was the deposit caused by the admixture of too great a quantity of lime with the coal?

Mr. Spice—Not because there was too much, but because of the very presence of the lime there. It presented no difficulty when we understood the nature of the deposit. When my attention was first called to it I said there could be no effect without a cause, and I asked my manager if he had considered the causes. He replied in the negative. I examined the material and divined the cause. I directed him to blow out the flues. In the course of the week he reported what improvement had been made. By the end of the week the heats were as good as ever, and so also were the retorts. This is the simple explanation of the difficulty which had caused the manager to put on a long face when I saw him on the morning that I asked him how he was getting along, and was greeted with the reply, "Not at all." I inquired, "What is the matter? Something new?" He said, "I am losing my heats in spite of all that I can do." He had a sample of the stuff that he had taken out of one of the flues. I told him he was using a new form of coke, or one with lime in it, which tended to form a mass something like cement; and that the deposits were blocks of solid matter which would not have become solid if he had blown out the flues oftener than had been his former custom.

Mr. Harbison—What does Mr. Spice find is the yield per pound? And what is the effect upon the illuminating power of the gas?

Mr. Spice—The illuminating power is not affected in any way. The yield is about 10,200 feet per ton of 2,240 pounds of Newcastle coal—which is considered very good working. We have not found that our annual make has been affected in the slightest degree by the use of this process; but we have found, as a result of critical examination, that there is a loss of illuminating power to the extent of 0.2 of a candle only—a consequence of the admission of air to effect the revivification of the oxide *in situ*. As gas men we would call that nothing to speak of.

Mr. Harbison—I am not sure that I remember the precise statement in his paper as to the cost of slaking the lime and mixing it with the coal.

Mr. Spice—In the absence of apparatus similar to that in use at our works, it has been found to cost one-half penny per ton. It added just so much labor to the coal wheeler. As a practical test, I found that, for the year 1884, instead of having used 2½ per cent. of lime (which is the prescribed quantity), we had used only 2¼ per cent. That was as near as a man could work. You must understand that we have not weighed it at all. We found, by practical experience, that a shovelful of lime to a barrow load of coal was the proper mixture.

Mr. Harbison—As Mr. Spice has said, the gas works in this country using mechanical appliances in charging and drawing retorts are quite exceptional. There are only two or three places in America where the work is done in that way. The handling of the lime—slaking it in one building and bringing it into another—has to be done by manual labor. Could he give us an estimate as to what would be the cost under such circumstances?

Mr. Spice—In England we found the labor charge to be about one-half penny per ton. You might put it at one penny if you like. It is nothing serious, though.

Mr. Fullager—Suppose the lime is not sufficiently mixed with the coal; what would be the effect?

Mr. Spice—The lime is always sufficiently mixed with the coal. We put the lime on top of the heap of coal. It is sufficiently damp not to fly about; and there is none of it lost when put on the coal on the floor.

Mr. Harbison—But suppose there were 20,000 pounds of coal on the floor at one time; would the lime then be sufficiently mixed with it?

Mr. Spice—I should not put down so much coal as to have it dry up through all the moisture being expelled. If you do that you will make millers of your men. There is no occasion for that at all.

Mr. Enfield—Has the lime process any effect upon the deposit of carbon in the retorts?

Mr. Spice—None whatever.

Mr. Enfield—Does it cause more or less carbon?

Mr. Spice—It scarcely makes any. We work with very light pressure on the retorts (and with as even a gauge as possible), and are not troubled with carbon in them. In works which were troubled with stopped ascension pipes it was found the coal liming process put an end to that bothersome condition.

Mr. Fullager—What would be the effect if some of the lime were deposited on the tar in hydraulic—the tar being light, and working no seals?

Mr. Spice—We never had any drawn up the ascension pipes. Your idea would have a foundation of practical value if you assume that dry lime were being put into the retort. You must bear in mind that this equal weight of water stops all that. The lime is laid hold of in the retort.

Mr. Fullager—If put on the retort house floor the lime would immediately dry up.

Mr. Spice—Then don't put it there.

Mr. Fullager—You have got to put it there.

Mr. Spice—I assume, as a practical man, that I would put my coals in front of the retort bench.

Mr. Littlehales—I think there is some misapprehension, as to this matter of purification, arising out of the fact that in the large cities of England lime cannot be used on account of the offensive smell. In fact at one time its use was practically prohibited until it was found that the sulphur compounds could not be eliminated except by the aid of sulphide of calcium. The oxide is one of the cheapest and least offensive of purifying materials. America is a "great, glorious and free country," where everybody can do as he likes; and so nobody has any trouble over the use of lime. That fact makes a great deal of difference in our understanding of this question.

Mr. Helme—I would like to ask Mr. Somerville if he used oxide of iron alone?

Mr. Somerville—No; I used part oxide and part lime.

Mr. McMillin—The question of Mr. Enfield is of no little importance. Mr. Spice says that, practically, he had no carbon in the retorts. Perhaps he did not have any before; but it strikes me that the new scheme would have a tendency to prevent the deposition of carbon; and our experience at Columbus, Ohio, leads me to that conclusion. We there use the native coal, which contains 12 or 15 per cent. of water. I mean, of course, we use that as part of our charge mixture, and when we use it our retorts never suffer from carbon deposit. Now, if the water contained in the native coal prevents the deposition of carbon, and even goes so far as to remove it, it strikes me that the water in the lime would have the same effect. I think that not only experience, but also reason, teaches the same thing. The decomposition of water vapor there in contact with the hot surface would have a tendency to take off the carbon.

Mr. Harbison—Do you not find that the water in that coal impoverishes your gas? Is that the way you make water gas?

Mr. McMillin—No. If we could only keep it there it probably would benefit us; but the water usually drops at the hydraulic main—at any rate, it does not get any further than the "standard" scrubber.

Mr. Lansden—I want to understand the cause of this difference between Mr. Somerville and Mr. Spice. Does not Mr. Spice use the coal in a much finer or pulverized condition; or can we in this country, with our lump coal, use it in the same way that he would use the Newcastle coal? Would not our coal have to be crushed?

Mr. Spice—No; your nut coal would do very well. The largest lumps of coal would need to be broken up; and perhaps the smaller the coal is the better would be the result. Still, it is a question of degree—affecting not the grand results, but the exact results of the sulphur compounds. You would not have them so much reduced if you only whitewashed your lumps of coal and put those whitewashed lumps into the retorts. It is a question only of degree. It is only a question of reducing the sulphur compounds with greater or less efficiency.

Mr. Harbison—Would the same result be obtained if the lime was not mixed with the coal in the retort house?

Mr. Spice—I would prefer to mix it. You would spoil your coke by having great blotches of lime on it. The lime should be evenly distributed. The consumers might object to a large patch of lime on the coke.

Mr. Harbison—If the lime were put in after the retort is charged would it not mix thoroughly with the coal?

Mr. Spice—It would not mix sufficiently there. It should be mixed before the charge goes into the retort. I should prefer to have the lime exposed to the heat of the retort house till the water is driven off.

Mr. Harbison—I would like to have Mr. Somerville tell us (a little further than his paper does) what his personal impressions are with regard to this matter; or as to what causes the difference in the results obtained by him and those obtained by Mr. Spice.

Mr. Somerville—I would like to state it was with great regret, and in fact with some mortification, that I failed in this thing. When I started in I did so in good faith; and in the hope that the sulphur compounds could be decreased, and the amount of ammonia be increased, to the extent that Mr. Spice has said. It was an important thing to me. I was turning the ammonia into sulphur, and I did my very best to make the experiment a success. I broke the coal up very fine; in fact I used what is called slack coal for the purpose of thoroughly mixing the lime with it; for I understood that a great deal of the success of the experiment depended upon this thorough intermixture. I have stated the results. I will state where I think that Mr. Spice gets his extra ammonia—for it was the extra ammonia that I was driving at. The water that goes in with the lime helps, to some extent, no doubt, and the nitrogen of the air which he draws in also helps to make ammonia. I think there can be no doubt about that. Then, as to the purification. Of course, the lime going in with the coal purifies, to a certain extent, the crude gas. There can be no doubt about that either. Then, with the most elaborate and thorough scrubber purification which they practice in England—thus taking out a large percentage of the carbonate of soda and of sulphuretted hydrogen—there is very little work left for the ox-

ide of iron to do. This molecule of one per cent. effects, just as Mr. Spice states, actual purification in the closed vessel. The oxide of iron is actually revivifying, it seems to me, by this method: First, the water gives nitrogenous compounds; next the entering air affords still more; and then the scrubbing, taking out a large proportion of the impurities, leaves very little for the oxide of iron to do.

Mr. Wood—Would not Mr. Spice (in using the fine Newcastle coal) so reduce his yield as to lose in value of gas product that gain which he secures in purification?

Mr. Spice—It is simply a question of degree; and this enables me to use a greater proportion of cheap coals. Do you get much less gas from slacked coals?

Mr. Wood—Very much less.

Mr. Spice—We do not want the coal to be in the form of slack or dust; but we do not care overmuch about its being small.

On motion votes of thanks were tendered to Messrs. Somerville and Spice.

The next paper read was that contributed by Mr. John C. Pratt, of Jamaica Plain, Mass., on the subject of

THE PRESENT STATE OF THE GAS INTEREST.

The author read as follows:

Three years ago I had the honor to read before this Association a paper giving my views on the "Future of the Gas Interest." As some of you may remember, I prefaced that paper with an apology for presenting and advocating a policy, that had not been recognized by the gas interest of the country, which very likely would not receive your cordial assent and approval, as proved to be the case.

Still the discussion that ensued, and the criticisms that were offered, though keen and incisive, were in the kind, gentlemanly and courteous spirit ever characteristic of the discussions of this Association.

It is not the object of this paper to vindicate the views I then presented (except so far as events have proved their correctness), but to show, as briefly as I can, the real advance made in what I conceive to be a sound and healthy sentiment and policy by the gas interest in this country.

As a reminder of some of the points I endeavored to enforce, permit me to read a few extracts from the paper referred to.

"Until within the past few years the gas company has not only enjoyed a monopoly, but a comparatively quiet and undisturbed monopoly, of the business of furnishing illumination; we have always had the chronic grumbler, who disputes his bill, and denounces the meter as a fraud and the managers as swindlers. These, as long as human nature remains as it is, we shall always have; but the public are waking up to this subject, and discussing it; the newspapers join in the hue and cry, and are ready to do all they can, by favoring any and every practicable and impracticable scheme, to break down this 'huge monopoly.'

"It is hardly necessary to state all the reasons that are given for this opposition; the whole may be summed up in one sentence, and that is: 'Gas companies are making more money out of the public than they have a right to make.' In proof of this they call attention to the fact that we furnish no reports—that we do not let the public know what we are doing; and the assumption is that we are afraid to do so. I will neither admit nor deny the truth of this last statement; but I fear that if certain companies were compelled to reveal their corporate secrets—to show how much money they were making, and how large a surplus they have accumulated—they would arouse a feeling in the communities where they exist in comparison with which the granger contest with Western railroads would sink into insignificance.

"Admit, if you please—which nobody will deny—that we have the right, under our charters, to keep from the public all information as to our business and profits, is it wise to do so? I claim that it is not. I claim that our business should be so conducted that we should be willing and glad to lay all its details before the public. There is no other manufacturing interest where the relations of the company and the people are so close, and should be so intimate and confidential.

"We are brought into daily, I may almost say hourly, contact with the people; we make their homes cheerful by the light we furnish; for one-fourth at least of the twenty-four hours they are visibly reminded of our existence, and how indispensable we are to their comfort and happiness. These relations create mutual obligations; and for these reasons, and those I have before given—viz., the rights and privileges they have conferred upon us—they have the right to know that the price they are paying us for gas is neither exorbitant nor unreasonable.

"There can be no doubt that this ignorance of our affairs, which are profound mysteries to the public, together with the fact, which cannot be concealed, that many of our stocks sell at a very high premium, is the prime cause of the discontent and fault-finding that are so prevalent and almost universal.

"The people think that the sale of a commodity which enters almost as largely into family use as water and food should not so enrich its manufacturers; and, whether right or wrong in their opinion, sooner or later they will find a way to ascertain the truth, and remove what they believe to be a great injustice.

"I believe the sooner we place ourselves in close and intimate relations with our customers—have no secrets to be kept from them, are able and willing to show them our whole hands—the better it will be for our future prosperity.

"If, then, gentlemen, you agree with me in this statement of my views, have the courage of your convictions, and tell your stockholders what you think there is in the future; what the dangers are, and how they may be averted, and leave the responsibility with them; tell them it is much easier to keep the field than to drive the enemy out when he has gained a foothold. Give them the facts, all the facts; they may be unpalatable, but are none the less facts; and, however unpalatable or disagreeable they may be, will have to be met."

Finally, I said:

"If, on the contrary, as is very likely to be the case, you think my views radical, visionary, and unsound; if you think me a foolish alarmist, presenting bugbears to be laughed at and scouted—then all I have to say is, let this paper, if it is printed with your minutes, be read five years hence, and see who is the prophet."

At the next meeting of the Association, held in the city of New York, in October, 1884, we listened to the able and instructive address of the President, Mr. Forstall, in which, besides giving many other valuable ideas and suggestions, at much greater length, and with far more ability, than I had done, he enforced and advocated the views I had presented. That address of Mr. Forstall's has become a part of what we may call the standard gas literature of the day, and has been cited as authority at hearings before Legislative and City Committees. I read, in a late number of the *North American Review*, liberal extracts from it in an able article on the gas question. I need not say that I was proud of such an endorsement.

It should also be said that the American Gas Light Journal has ably advocated similar views.

Now I come before you again, not by any means claiming superior knowledge or extraordinary foresight; but, in all modesty, to say that what I thought possible, from a careful review of the situation, might develop in five years, has been realized, in some parts of the country certainly, in less than half that period.

I propose, briefly, to review some of the events of the past two or three years; to look at the present situation, and suggest such a policy as, in my poor judgment, it is wise for us to pursue to meet and defeat the common adversary who now menaces us with a bold front—for it must be obvious to every one who watches the course of events, and observes what is going on in almost every part of the land, that there never was a time when the gas interest was in as great peril as it is to-day.

Our present duty is to devise and apply the proper means to defeat this enemy; and I firmly believe that we can accomplish it—and that without resorting to the use of anything more expensive or difficult than plain, practical *common sense*.

In Massachusetts we have had within the past two years a high carnival of new gas companies. In the legislative session of 1884 an attempt was made, by parties from Philadelphia, Pa., working in the interest of the Standard Oil Company, to secure the repeal of a law which provides that no illuminating gas shall be distributed that contains more than 10 per cent. of carbonic oxide; this, after a hard-fought battle, we defeated. The legislature, at its next session, again refused to repeal or modify the law.

With such a law on our statute books it would seem as if water gas was barred out of our State; but some of these parties think they see a way by which the law can be rendered nugatory (they claim that they can eliminate the poisonous element); and so the past year we have had three water gas companies trying to gain a foothold in Boston and vicinity.

One—an offshoot of the United Gas Improvement Company of Philadelphia—modestly claiming it as their intention to control, by purchase or lease, the whole gas interest of the State, and to have awarded them out of the capital stock the trifling sum of three million dollars for their water gas patents. They have purchased most of the stock of the South Boston Company—about $400,000—at a premium of ten per cent., and have probably reached the end of their negotiations. Two other companies have organized under our general law, which permits of such organization with a capital not exceeding $500,000.

One of these companies made application to the legislature for leave to increase its capital to five millions—which application was refused; the people began to see the cloven foot. It is now endeavoring to raise the requisite capital through the agency of a collateral company organized under the laws of Pennsylvania, but thus far it has met with poor success. The stock is difficult to dispose of—the principal party being the same person who built the new works in Chicago, which have gone into the hands of a receiver. The third company is practically doing nothing at present.

Amidst this confusion and excitement the gas companies have settled down quietly in the belief that they have no cause for anxiety. We still survive, and are likely to live and prosper. To be sure, like a certain wise man who, after the horse was stolen, closed and fastened the stable door, we permitted one of these companies—the second referred to—to obtain leave of the city government, *by the customary methods*, to lay their mains through our streets, and then secured the passage of a bill taking from the city government the power to grant such a privilege without the approval of a Commission appointed by the Governor. However, no harm has yet ensued; nor have we any fear that serious trouble will come upon us in consequence. The city of Boston is not an inviting field for opposition gas companies; the

price of gas is too low to offer an inducement for capital to invest in competition. And it is surprising to see how the people and the press are waking up to a realization of the fact that, while one company, distributing a thousand million feet of gas, with a plant costing five million dollars, and capitalized at half that sum, can sell gas at $1.50 per thousand cubic feet, two companies, with the plant, mains, taxes, salaries, and the thousand other expenses duplicated, and the capital of the new company doubled by watering, cannot divide that business, distributing the same thousand million feet of gas at as low a price.

The people in our community are just waking up to a knowledge of the fact that the effect of competing gas companies, as Mr. Forstall so truly and tersely put it, is "to make cheap gas practically impossible."

And now, where do we stand? The wheels of time move rapidly; but hardly more so than has the change of position with gas companies in the State of Massachusetts in their relation to the people. Circumstances have led them to the conclusion that it is best to be more open in their dealings with the people; that if the people are let into the secrets of their business, are permitted to know something of their profits, and whether or not they are being charged a fair price for gas, a friendlier and better state of feeling will exist, and much of the hostility toward gas companies will disappear.

Three years ago such a policy had few advocates among them; the methods, business, and profits of gas companies were secrets which the people were not permitted to know of or investigate. Unlike railroad and other corporations deriving their existence and support from the people, the people were kept in utter ignorance of gas matters; and this was deemed a wise and prudent policy. Note the change.

Last winter every company in the State joined in a movement to secure the passage of a law providing for a commission, to be appointed by the Governor, to whom shall be made annually a full statement of the business of every gas company; and that commission is to give full information to the public of the condition, business, and profits of every gas company through the publication of their accounts.

The members of that commission have power to establish the quality of gas sold; practically, they have the power to fix the price at which gas shall be sold. If, upon an examination of the profits of a company, they shall decide that they are unreasonably large, or if, upon complaints made by the consumers, and after the consumers and company shall be heard, they shall decide that a reduction in price is right and proper, that decision would not fail to be regarded by the company; it would not be wise or safe for it to do otherwise. At the same time they are empowered to give ample protection to the gas companies, as no competing company can establish itself in any city or town until that commission is satisfied that the existing company is unfaithful to the public, and that there is a necessity for another company. We are satisfied that a board of honest, impartial men, appointed by the Governor, will give us all the protection we require. And this commission, with these powers, the gas companies, not the people, have asked for and obtained. It cannot be denied that a new era has opened upon the gas interest.

The question more important than all others for us to consider to-day is—How is the gas interest of this country to be protected?

I answer: *First*—By selling our commodity at the lowest possible price consistent with fair and reasonable dividends. Most of us have already reached this conclusion; and the sooner we all establish ourselves there the better will it be for our safety. Mark what I say—*fair* and *reasonable* dividends; and those on a capital predicated upon an amount not in excess of the actual cost of plant. The people will not quietly consent to pay, in their gas bills, unreasonably large dividends; nor will they pay on watered stock.

Second—By giving the people absolute knowledge that we are doing this, by convincing them that we are dealing fairly by them. It is largely our own fault that the people have become jealous and hostile. It is really not that we have wronged or defrauded them; but they have been led to believe it is so, because we have not been open-handed with them. It is this which has poisoned the public mind—filled it with erroneous ideas—and led it to hail the advent of a new gas company as a deliverance from the oppression of a tyrannical monopoly, and the harbinger of cheap gas. "Cheaper gas!" That was the cry of the people in Boston who had a 20-candle gas furnished them at $1.50 per thousand feet; and almost every merchant, banker and housekeeper signed a petition for the new company, and promised it their patronage.

That was the case in Boston two years ago; it is not so to-day. If we have changed our methods in dealing with the people, I am glad to say they have been quick to discover it; and I venture the assertion that few signers to a petition in aid of a new gas company could be obtained from intelligent citizens to-day.

Third—Educate the people in these matters.

There are many things in the gas question in regard to which the people require information, and such information as we are best able to impart. There are two instrumentalities generally made use of by these men who have for the past few years been raiding upon the gas interest of the country, and upon these they mainly rely.

One is to satisfy the people and enlist their support by the promise of cheap gas; and the other, by the use of money, to secure votes in the city councils to carry their schemes.

Our business is to set the people right in this matter, and create a public sentiment so strong and powerful that aldermen will not dare to sell their votes to help a scheme which they know their constituents will condemn. For, depend upon it, there is such a thing as pressure of public opinion being brought to bear upon corrupt city governments, with effect, if that pressure be persistent and strong.

Show the people, then, that competing gas companies are inimical to their true interests; that, as a rule, they are swindling, stock-jobbing concerns, and have proved so in almost every place where they have gained a foothold; show them that water gas, as a cheaper and better gas than coal gas, is the veriest humbug that was ever foisted upon the public; that its claim for greater cheapness is a delusion and a fraud; and that if its claims were well founded we should be the first to avail of, and adopt, its use.

Tell them what coal gas costs to manufacture and place in the holder; be not close-mouthed about this. We have been afraid to meet this question, and it is a great mistake we have made—entire frankness is much the best policy. Tell them the simple facts, and demonstrate to them, as you easily can, at the best that is claimed for water gas, the difference in cost per thousand feet is but a few cents—so small, so insignificant, that the consumer never will see it in his bill. That the principal cost of gas is its distribution, which charge is the same with the one as the other, and with a general change of manufacture from coal to water, the price of naphtha would so advance as to turn the scale of cost in favor of coal. Convince them of these things, and no unscrupulous man will have the effrontery to assert, as one of them did before the Boston Board of Aldermen, that he could make and distribute water gas of 25-candle power at a cost of fifty cents per thousand feet.

Show them that behind these new companies is the unseen, hidden hand of the Standard Oil Company—a corporation more powerful than any other in the land—with its untold millions of capital riding roughshod over every interest that stands in its way; a corporation that controls the largest and wealthiest railroads in the land, and compels them to bow to their mandates; a power that controls legislatures and governors, that elects senators, and whose money fills whatever offices it deems necessary for the success of its schemes; a power greater than any other in deciding who shall be the candidates for the highest offices in the gift of the people; a power that breaks and ruins where it cannot buy, that crushes where it cannot control.

Convince the people, by figures and facts—as you easily can—that it is for the interest of gas companies to deal honestly with them; that no company can afford to secure the ill-will and hostility of its customers by dishonest practices; that our business, if conducted fairly and honestly, yields a fair and reasonable profit; that there is no other business where honest, square dealing pays so well as the gas business; that our prosperity depends more than anything else upon maintaining the best and friendliest relations with our customers; and in this, if there were no principle involved, we have the strongest incentive for fair and honorable dealing with them.

Turn on the full blaze of your intelligence; let the people see—yes, compel them to see—with your eyes, all the facts in the case, and they will be your friends. Educate the people up to a full knowledge of all that is involved in this subject, and I hesitate not to say that every honestly managed company will have a sure and permanent tenure of the field it occupies, without interference or interruption.

To produce this intelligent public sentiment, I look upon the appointment of a gas commission, such as we have now established in Massachusetts, as one of the very best agencies. Such a commission affords protection to the people and to the companies. The people obtain a knowledge of the business and profits of gas companies which they can rely upon—coming as it does through a board of impartial men whose duty it is to carefully investigate their accounts; and they will be satisfied that their profits are not in excess of a fair return on the capital invested. Satisfied on that point, hostility on their part will come to an end.

On all questions that may arise between the people and the companies, on all complaints that may be made by consumers, this commission of able and discreet men will act as a board of arbitration, to hear and investigate all such questions and complaints; and their decision will be final, and should be satisfactory to both parties.

If the gas companies behave honorably and fairly toward the people, they can feel certain that their property will not be depreciated in value, or their business ruined by foreign speculators. On every principle of justice and equity the people, and the capital that is invested in the gas interest, have a right to the protection which such a commission affords.

Now let us hear the conclusion of the whole matter—and I give it to you

as my closing benediction: "Be true to the people, and the people will be true to you."

On motion of Mr. Greenough, the thanks of the Association were tendered to Mr. Pratt for his able and interesting paper.

Discussion.

Mr. Greenough—Mr. Pratt alludes in his paper to the duties of the Massachusetts gas commission, but I am not sure I understood him aright. Perhaps he will be good enough to state again what, in his opinion, are the duties of the commission.

Mr. Pratt—It has power to hear the complaints of people, like that possessed by the railroad commission. It can investigate the question for the purpose of determining whether the gas companies are making too much money (as shown by the matter of dividends declared), and whether the price should be reduced in order to bring the receipts within a reasonable dividend limit. Then, when the investigation is completed, it has power to recommend such reduction in price; and, as in the case of the recommendations of the railroad commission, such suggestions would undoubtedly be acted upon.

Mr. Helme—Mr. Pratt says that if we are true to the public the public will be true to us. I take it the public has really very little to do with these opposition gas companies. The schemers at the head of opposition movements care not how much money they spend—as long as it is not their own; and many of them, in fact, have very little of their own to spend. They generally get their "rights" by operating on the city council; and the "rights" are secured in such a manner that you cannot fasten their corrupt practices upon them. How do they operate? They obtain the privilege of building a gas works in a certain city, the next step being to secure promises from the gas consumers to take gas from them at a lower price than the already existing company is furnishing it at. With these two items secured they go off to another city (they do not stay in your city to raise the money), and interview old men and women, also trustees who have no responsibility. They show the "investors" a most beautifully printed bond—one of the handsomest possible specimens of the engraver's art—and grow eloquent over their description of what "a splendid thing" they have got hold of if they can only get the money. They tell them "these beautiful bonds" will pay their holders 6 or 7 per cent. interest, will run for 30 years, and are secured by the works that are about to be built. A good deal of money has been secured in that way. I know some of the men who have contributed, and can "speak by the letter." The bond sellers are good talkers; and, besides, they have the success of the gas business generally to help them out in their arguments. Certainly gas companies, as a general rule, have been successful; and if some of us had not asked rather high profits in the beginning we would now have been driven out. I admit that, and am not ashamed of it. If I had not done so I would have been driven out in less than twelve months. With the profits made by us years ago we are now fighting our present battle. Well, after the bonds have been shown, and the people are told about the glorious prospects of the embryo company, the "financier" says, "I will give you one of these $1,000 bonds for $1,000 in money; and I will also give you $1,000 worth of stock for $100 in money. In other words, you shall have $1,000 in bonds and $1,000 in stock for $1,100." Hundreds of thousands of dollars have been obtained in that way in Philadelphia alone, and I know many of the men who have so contributed. One man, living on Front street, Philadelphia, who had for years been a large stockholder in the old Chicago Gas Company, was actually led to believe that he was contributing toward the aid of that company when he paid down $25,000 cash for stock and bonds in the opposition works. When a certain sum of money is "gathered in," they get up a construction company to build the works, and the plant comes into existence. The pipes are laid in the streets, the lamps are put up—and there they are in your way. What can you do but fight them? The people are not true to us in such cases, because, in many instances, they sustain these operations even though they know that the "right" was obtained in an improper manner from the councilmen, or that it was secured as a result of misrepresentation. Where does the support of the public come to the gas company in such a case as that? I confess I do not see it.

Mr. Littlehales—With all deference to the last speaker, I must say I entirely disagree with him. Investors are about the same as other sorts of humanity. The happenings cited by Mr. Helme may occur once or twice; but when (after one or two instances) the people find no return is made on such "investments" they will cease to "invest." It is natural that the gas consumers of different localities, on finding that opposition does (temporarily at least) reduce the price of gas—and often it causes permanent reduction—should encourage opposition movements. Indeed I could cite many instances where a doubling and even trebling of the capital was followed by a permanent reduction in selling rates. Now, if the original company had kept its rates within reasonable limits the necessity of ever assuming a "fighting" position, as mentioned by Mr. Helme, would be extremely problematical. The seeming paradox involved, in the case of increased capital and reduced rates, is explained on the ground that the original company had taken too much from the public. I think the public, in nearly all cases, will remain fairly true to the pioneer company. I have never yet heard a gas consumer complain or object to a company taking a fair and reasonable dividend. What is objected to—and, in my judgment, the objection appears reasonable—is that during times of business depression, or when many of your consumers are striving hard to "make ends meet," and with but poor success, the price that rated during the prosperous period is still exacted. There is where "the rub comes in." The nearer you bring the gas business down to the practical basis of paying dividends only on a legitimate capital—and sell your gas at such price as will enable you to do but that—then the trouble resulting from opposition gas companies will end.

Mr. Pratt—I fear many of us will be buried before that time comes about.

Mr. Thomas—Mr. Pratt speaks about educating the public up to think favorably of gas companies. I fear that would prove an uphill task. If we had more of the "Sam Jones" order of men, with a more copious supply of other educators thrown in, we would still find that sort of educational process very hard work. The best way to protect the gas consuming interests is in the appointment of State Commissions, moulded on the plan of the railroad commissions. That is the proper policy. These bodies could regulate selling prices in such manner as to make the rates equitable to producer and buyer. In regard to opposition gas companies, the parties who organize them are merely interested in the business for the sake of making large dividends for the "promoters." For instance—the managers of the New York Equitable Company, whose arms, octopus-like, are spreading out over this country, are now selling stock and bonds with the object of establishing an opposition company in Chicago, Ills. These bonds are quoted at from 85 to 95, and the stock is quoted at 40. The managers of the scheme intend to make their profit out of the preliminary financial transactions. What do they care about the price that will in future be charged for gas? When the former opposition Chicago (the Consumers) company was organized the promoters capitalized it at $5,000,000. They erected a works which they claimed cost $1,200,000; but I think they would have made a very large dividend if they received $800,000 for building that plant. The low price charged by the old Chicago Company for its gas has proved a stumbling block—not to the original promoters of the opposition movement, but to the fools upon whom they unloaded. The "investors" are the ones who suffered—and are suffering. A New York man whom I heard speaking on this matter of the Consumers Company, said he intended to put $10,000 in it. I told him I thought he would be foolish to make such an investment. He replied, "Well, I want to have a little fun. I have plenty of money. I have made a good deal of money out of some of the others; and should I lose that $10,000 I will not care." There are plenty of such people in existence. Numbers of them are ever ready to invest in such schemes; and these are the parties who do the most mischief. The sensible plan of doing away with opposition schemes is to form State organizations. Frame proper bills, and have them enacted into laws by your Legislatures. Have Commissions created, and clothe them with proper powers. With such bodies in existence the "true inwardness" of the motives impelling opposition schemes could be shown up, and even custodians of trust funds might have their eyes opened. As it is now all that is required in most cities to give the schemers a foothold seems to be the "seeing" of a certain clique of office-holders with the planking down of a certain sum of money. Making an impression upon them in any other way would require the discovery of a new power. If you want to fight opposition successfully commence in the right way. Get your commission; let it regulate the matter of new gas companies; let it regulate the price of gas; in short, let it attend to the carrying on of the business in a business-like manner. Of course, gas companies ought to (and a number of them do) sell gas as cheaply as they can. Some companies heretofore have rather crowded their consumers, through charging excessively high rates; but if the companies will reduce the price so as to pay only fair and reasonable dividends, they will place themselves in proper position to drive this competition (or rather opposition) out.

Mr. Harbison—I heartily agree with the sentiment of the paper when it says, "If you treat the public well they will treat you well:" and I speak from experience. I do not concede brother Helme has a right to glory (if he calls it by that name) in the fact that he now has a fund on hand to fight opposition with, and simply because he has amassed it years ago from his consumers as a result of charging too high a price for gas. I believe, in heart, that is the reason why he is now in trouble.

Mr. Helme—You need not distress yourself much about it.

Mr. Harbison—I will not distress myself at all except for your sake. I have before, in other places, and also before this Association, advocated dealing fairly by the public, in the belief that if you do so the public will deal fairly by you. I do not, in behalf of the company I represent, fear opposition from any outside influence, or monied associations of men, in the establishment of opposition gas works in our city of Hartford, Conn. There is no field for them there, and they realize it. They have been there, have

looked us over, but got no sympathy from any division of our entire population. They have freely acknowledged this to me. I say that much in justification of the gas policy pursued for over a third of a century in Hartford. It has been the constant aim of our company to furnish an excellent illuminating gas, at the lowest possible price, and pay a fair dividend to the stockholders—never beyond 11 per cent; and for the last six or eight years only 8 per cent. The company has never had a dollar of watered capital, no bonds out, and never had any since the first notes were given for the building of the works, the same notes being redeemed at the rate of one hundred cents on the dollar. I have no sympathy with the stockholders of a company suffering from an opposition contest, who, at an earlier period in their history, voted in as directors men who afterwards added largely to the capital stock, and received large dividends on that watered capital stock, or shares not represented by money paid in and actually invested in the works. I have no sympathy to waste on them. I do not think they are entitled to any in this age. I agree fully with what Mr. Littlehales said—that gas companies have rights, and that the consumers also have rights which gas companies ought to recognize; also, that when times are hard the gas company should not grind the last dollar out of people who are laboring hard to make both ends meet. Of course, stockholders are entitled to an equitable return on their honest investment, and managers of companies would not be justified in furnishing gas at a less rate than would enable them to return a fair dividend to the stockholders, some of whom are depending upon their investment in gas stocks for a living. I do not believe that a gas commission is the great panacea for our ills. We have a railroad commission in Connecticut, but that fact does not prevent outside marauders from appearing before our Legislature every year (for the past twenty years) in the endeavor to get a parallel road between New York and Boston, in order to injure the New York, New Haven and Hartford road. They are there every year; they have to be looked after all the time—a railroad commission cannot keep them out. And a gas commission could not keep out opposition in the gas business unless its members were clothed with absolute power by the legislature. Then, again; how is this commission to be appointed, and what would be the means used to get around the commission? Would you place the appointing power in the hands of the Governor? The Governors of all of our States are not beyond suspicion. Are they any better than the average aldermen? There are a great many points bearing on this whole matter; and it is very difficult to declare that any one particular line of action will benefit the entire gas interests of the country. I believe, first of all, that you should devote your energies and abilities to the manufacture of a good illuminating gas, and furnish it at the lowest possible price which will enable you to pay a fair return to your stockholders on the investment. This, I believe, will be the best protection that the gas interests of the country can have. It is the line of policy I trust will be adopted and carried out—carried out where it has been adopted, and adopted where it has not been. I trust every one will labor to that end, and then there will be no trouble.

Mr. Greenough—I will say a word in reply to Mr. Harbison. I think he makes a mistake if he counts too much on the good will of the people of Hartford towards the gas company. The Boston Company has been attacked at various times in the last twenty years; and as long as we had a city government which was a credit to the city it continued to vote that one company was enough in our town at one time. The character of our great cities changes. The city of Boston has undergone a most unpleasant change with respect to its city government. One of the results of this change has been permission granted to a new company to supply gas anywhere in Boston. Now, however, that one horse has been stolen, we have locked the stable door. The Boston Gas Light Company, some five years ago, tried to get a commission appointed in the State of Massachusetts; but in that effort the Boston Gas Company was defeated by other gas companies in the State. Mr. Thomas is right when he says that the policy of protection in this country is to have separate gas commissions in the separate States. That is the best policy, in my judgment; and for Mr. Harbison to oppose it here is, I think, a mistake.

Mr. Harbison—I said they would not be found useful in keeping out opposition unless you gave them power.

Mr. Greenough—Of course you must give them power. As the gas commission stands to-day in Massachusetts, any company that accedes to the recommendation of the gas commission is practically sure of having no competition in its town, because any new gas company wishing to do business in a city or town of Massachusetts where there is an existing gas company, has not only to get permission of the selectmen or aldermen of that town, but has also to get permission of the gas commission. I venture to resent the suggestion that ordinarily the governors of Massachusetts are any such men as have filled some of the aldermanic chairs in our large cities. As long as Massachusetts remains the kind of State that she is, I think we will get honest men appointed on our gas commission; and as long as we have honest men on that gas commission to execute the law as it stands, I think the gas interests of the State of Massachusetts will be practically safe. The members of that commission have power, like the railroad commission, to investigate the figures of a company. They are to have full power of ascertaining what business is being done by the different companies in the State; and, in return, the companies are to have protection. It is a fair bargain. The sooner other companies in this country, which may still be enjoying immunity from competition, go before the legislatures of such States as are capable of appointing honest men to office and ask for commissions of that kind, and without waiting until it is too late, the better it will be for the companies. I think that is the remedy at the present time for the competition which is springing up throughout the country. And, in proof of the fact, it is matter of common report that some gentlemen in Boston, who are now scheming for an increase of capital and for a repeal of the water gas law, are also endeavoring to attack the gas commission. They do not want that kind of an investigation into their affairs. They are not the first ones to come into it when there is danger of having their own books examined and their own way of doing business looked into. One of the attacks to be made in Massachusetts this year is to be made on the gas commission, in order that the opposition gentlemen who wish to practice their profession in Massachusetts may not be stopped from doing so. I cheerfully sustain all that Mr. Thomas said.

Mr. Wood—I quite agree with Mr. Harbison that, to furnish a good quality of gas at a low price, and to cater to the public interests in all directions, would strongly tend to protect the existing companies against opposition raiders. In Connecticut, however, they are quite differently situated from most of us. There the gas man is fortified, in that the raiders, in the first place, are compelled to obtain the consent of the State legislature before they can secure a franchise to build a gas works in any Connecticut town. Then, I presume, with that consent obtained, the promoters are obliged to obtain consent of the council or selectmen before they can go ahead with their scheme. Thus it is seen they have to buy up the legislature before they can get at the council. With most of us, though, any set of individuals can form a gas light company by filing articles of incorporation with the Secretary of State and County Clerk, and then, by authority from Common Council, may dig up the streets and erect their works. Dealing fairly with the people will not always succeed in fortifying a company against the action of such common councils as we have in some of our cities; and that has been fully illustrated in the city of Boston. We all know that the old Boston Company furnished a good quality of gas, at a low rate, for many years, and that the dwellers in that city's suburbs were served as far as the company's charter permitted it to advance into the outlying districts. Nevertheless, a simple application to the Boston common council induced the aldermen to grant franchises to two opposition gas companies. Remembering this, it would seem as though catering to the wishes of the public will not save you altogether.

Mr. Helme—I think Mr. Harbison has pressed a little too hard on my case. I believe, were we to examine the history of the Atlanta (Ga.) and Hartford (Conn.) Gas Light Companies, as shown by the records of each during the last 30 years, the managers of the former corporation need not be ashamed of the comparison. Mr. Harbison's company, for a certain period, paid a 12 per cent. dividend. His consumption then was four or five times greater than ours at Atlanta is now; but we never paid over 10 per cent. Now he is charging $1.60 for gas, and thinks the price is low; but it is paying his stockholders 8 per cent. We all know that the insurance business keeps the city of Hartford in splendid financial condition. When Mr. Harbison went to Hartford, Atlanta was a little cross-roads village; and for four or five years after our gas company was started our annual product was not over eight million cubic feet. We were obliged to charge rather an excessive price. Since we have been in a position to do probably one-third of the business enjoyed by the Hartford company, we have not charged a higher rate than his, nor in fact as high a one. I think we have done justice to the public in that respect. Atlanta is a poor community. Four or five railroads center there; these give employment to mechanics, who constitute the bulk of the population. We have very few capitalists; and those that we have do not want to invest in gas stock. They have better outlets for their money, and can earn 18 to 20 per cent. on it in the other directions. The consequence has been that the gas company has been obliged to get along as best it could, deprived of the moral support which comes from having the "solid men" of the town interested in its local enterprises. The rebuilding of our works cost a greater sum than was originally expended upon them. During the war they had been neglected; heavy artillery traveled over the streets and broke the pipes; the entire works were burned down, and the holder was used as a target for a six-gun battery, for a month or so, when the gunners had nothing better to aim at. We have always sold our gas as low as any company within 250 miles of us. It is true we are nearer now to the coal field. In former times the quality of the coal used was very poor, although latterly it has improved. We could get but 3½ feet of 12 to 14 candle gas to the pound; but our people said, "Better that than nothing." We could not do any better for them then, as there was no railroad commun-

ication to richer mines. Now we are able to get good coal, and are selling gas at $1—not because we want to, though. For quite a while we charged $2.50. Where a three times larger business is done (as is the case with Mr. Harbison), where can be the justification for keeping up gas prices? We all know an increased output counts up rapidly in the gas business. Again, this thing of piling up profits, to reserve them for future emergencies, seems to be a moral sin in the judgment of some gas men. I fail to understand why it should be so considered. You watch a man enter a town and start in some sort of business; if successful he will, in a few years, tear down the old store and replace it with another much handsomer and larger. In doing that he commits a sin similar to the one we are charged with. I think it is wise to lay up something against the misfortunes of old age, and against the contingencies and emergencies of business. I think five or six dollars invested for every thousand feet of gas sold is not very extravagant, and few companies can make a better showing.

The Association then adjourned, to reconvene at 9:30 A.M. of following day.

SECOND DAY—MORNING SESSION—THURSDAY, OCT. 22.

When the members were seated and order called for, President Vanderpool announced that the morning's proceedings would be opened by the reading of papers. Mr. M. S. Greenough, of the Boston (Mass.) Gas Light Company, was then introduced; and that gentleman read the following paper on the subject of

STOKING MACHINERY.

It is with some hesitation that I have prepared a short paper upon this subject of "Stoking Machinery." It is one which can only be of personal interest to a comparatively small number of the members of any Association; since by far the larger number of works are too small to make it worth their managers' consideration for a moment; and, secondly, because many of the managers of the larger companies have undoubtedly given the matter their personal attention, and are familiar with the facts which I have to lay before you. At the same time there are also a number of engineers who are probably in the somewhat indefinite position in which we found ourselves in Boston a year ago—believing in the advantages of stoking machinery, in the abstract, but without any detailed or clear idea of what might probably be expected from the use of any given machine. It is to them that I more particularly address myself, as I believe that the examination which I have had occasion to make this summer into the merits of the various stoking machines may save them some trouble in the matter.

Firstly; it is worthy of attention that the two principal operations that take place in a retort house—viz., drawing and charging the retorts—really stand upon entirely different bases as regards economy; although when machinery is to be employed at all it is commonly supposed that it will be employed for both purposes; and, in point of fact, it generally is. In no English gas works that I have visited has one been used without the other; and yet it might very well pay to use a drawing machine in cases where it would not to use a charger. This will appear upon consideration of what must be done by the machines to perform the work now required of the men employed in each occupation. In ordinary cases it is true that the work of each man is so varied as to make it difficult to estimate the due proportion given to each of the different occupations in which a man is engaged who works at the fires. He probably assists in putting in the coal and in hauling out the coke. He helps to strike the lids; to ream the standpipes; to run the scoop; to draw the coke; to charge the furnace; and to remove the clinkers. With the modern improvements in large retort houses, however, it is getting to be more the custom to separate the work and to assign to each set of men a particular duty. With the introduction of generator furnaces there is gradually disappearing from gas works that well-known article, the ancient fireman, who knows it all, and who prefers his own ideas on the subject of heat to those of any other person. Brains are the material with which retorts can now be heated; and the man who tends the fires need have nothing to do with the labor on the charging floor. Coal is often brought in and coke drawn out from the cellar by men who have no other work assigned them. This leaves only the labor of drawing and charging the retorts, cleaning the standpipes, attending to lids, etc.

If it is desired to supplant this work by machinery, it can again be easily subdivided by using a drawing machine. This is, in every case, a comparatively simple piece of apparatus; and though the rough work to which it is put causes the necessity for frequent repairs, yet they are generally of a nature which do not long delay the work, and can easily be made. One man can run a drawing machine without difficulty. It only requires a set of rails in the floor, some arrangement for handling coke, and motive power. If this motive power is air or water, and is furnished from an accumulator at a distance to several machines, it is, of course, not proportionately more expensive to run charging machines at the same time, so far as the power goes; but if the power is to be steam and travel with the machine—a system possessing some advantages—then a set of rails may be all the change required, in a wide retort house, to allow of the introduction of apparatus with which one man can draw 174 retorts every 6 hours, or a proportionately less number every four. Suppose, for example, that a machine cost $6,000, and that it takes 20 per cent. for repairs—an estimate sufficiently large—we have $360 at 6 per cent. interest, and $1,200 repairs, or $1,560 a year. Divide by 365, and we have about $4.30 a day as the daily cost of the machine. Add to this two engineers, at $3.00 a day, and it makes $10.30. Add to this, 30 bushels of coke, at 5 cents per bushel, or $1.50 for fuel, and you get labor, fuel and interest, $11.80 a day for drawing 120 retorts, or thereabouts, every 4 hours. Suppose this to be done by men who did nothing else; and how many would it take? If it took six in a watch—which I think a moderate estimate—and they got $2.50 a day, it would be $30.00 a day for labor, or a saving of about $18.00 a day, or $6,400 a year on every machine employed. This would obviously pay for works where a much fewer number of retorts than 120 are used. With charging machinery the case, however, is different. The coal for the charger must be brought to it and put into an overhead hopper, if it is to work to advantage.

I have seen a charging machine used, it is true, when the scoops were filled in a coal shed, brought on a car by a horse to the machine, lifted by the machine and swung into place, and then pushed into the retort by hydraulic power; and it was claimed that there was a saving of money. At the best, however, this can be but little. To properly work a charger there should be a breaker, an elevator, and overhead bins to hold the coal, as well as some conveyance to fill these bins. I am aware that some companies work without a breaker; but when lumpy coal must be used it is, I think, a mistake. If coal is to be run into a scoop it can be done more evenly and more regularly in weight; and if it is to be blown into a retort it can unquestionably be better done if the coal is all of the same approximate size. Suppose, then, that a breaker and elevator are used; this requires power and attention. After elevation the coal needs distribution in bins, and probably some leveling in the hopper of the machine. To the first, then, some attention must be given—even if steam power is furnished; without it—considerable manual labor. To run the coal from the bins to the hopper, level it, and put it into the retort, would probably require an engineer and a helper.

All these essentials make the question of economy a much more difficult one. It is no longer so simple a question of arithmetic as the other. Circumstances will affect each company differently as to the way in which they can most conveniently handle their coal. One thing is very evident—that a much larger interest account must be paid, and that it will be necessary to work a much larger number of retorts by machinery to make it pay than if the drawing machine alone is used. If the full value of a machine is realized—that is, if all the work is extracted from it of which it is capable, then I have no doubt of its paying; but I am not yet prepared to furnish figures which would accurately show its economy.

The three principal motors—steam, air and water—have each their representative machines for stoking. Electricity, the new force, has not yet been applied in this direction; but an electric stoker has been promised. Taking these in order, we have steam in the Ross machines; air in the West machines; and water in the Foulis. It might be said, in a general way, that if only one or two machines are to be used, then it is unquestionably better to carry the power with the machine; but if power is to be supplied to a number, then there is much to be said in favor of concentrating it. In that case the question is to be at once considered of the relative merits of air and water for the conveying of power. On the one hand, it may be said in favor of air that it is perfectly safe to handle; that it continually supplies fresh, cool air to the heated atmosphere of a retort house; and that its conveyance to the machinery over a reel, through tubing, is very simple; and that the plant must be cheaper than hydraulic apparatus. On the other hand, it is to be noted that hydraulic power is now greatly used in many modern gas works for discharging coal, raising elevators, and lifting purifier covers. Although a hydraulic stoker requires a pressure of only about 175 lbs.—and that is more than an elevator needs—yet the views of hydraulic engineers are all turned towards supplying water at much greater pressure; and it is asserted by eminent gentlemen that to be economical it must be used in that way. A company is now delivering it in London at 700 lbs. pressure, and getting all the business they can do. If it is to be so supplied on the premises of a company, it would require but a comparatively small addition to the apparatus to run a stoker. The pressure pipe is carried along the retort house wall high in the air; and connected to it, by ball and socket joints, are hanging pipes, one of which is coupled to the machine, and allows it to serve several benches before it is necessary to disconnect and couple on to the next pipe—an operation requiring perhaps half a minute to accomplish. I did not see it in use sufficiently, perhaps, to hear any criticisms on its working; but I certainly did hear it said of the compressed air, when supplied through a hose and reel, that the action of heat on the hose tended to make it leak, and that it was frequently necessary to stop the work until a new hose could be put on. Judging from this, and other criticisms which were

made to me, I should not consider that the use of air had been wholly a success; and if I were to express an opinion on the subject of distributing power it would be in favor of water.

The West machine, however, is in no way dependent on the use of air; and, unless I am mistaken, there are machines now being constructed by Mr. West which rely upon steam, and propose to carry their boilers with them. His machine has been adopted by some of the principal English works. I saw them in constant use at one of the Manchester stations; at one of the Birmingham stations; and standing in a house just let down belonging to the South Metropolitan. In all cases it was stated there was an economy in their use; but the economy is so small, as compared with labor, that many other companies doubt the advisability of going to the expense. It must, however, be noted that 3½d. (or 7 cents) per thousand is a high price for retort house labor in England. Their wages are about half what we pay; and I am inclined to think that six-hour charges can be put in with somewhat less proportionate labor than four. At any rate, it is obvious that what might not pay there might handsomely do so here. Many companies there do not have so high a labor account as 3½d—2½d. is not uncommon, I believe; and one manager of a large company, whose name I am not at liberty to mention, gave me 14.83d. per ton as the cost of his labor when doing the work wholly by hand, and 8.6d. per ton as the cost by machinery, allowing nothing for repairs. Allowing 15 per cent. for repairs and interest, the saving was only 2.96d. per ton of coal carbonized.

To return to the West machines. I should only state in addition that the scoop is D-shaped, like the retorts, and that, as now arranged, it runs in to its whole length, without the wheels which were used at first to support it. The bottom is hung on two hinges, like a butterfly valve, and is opened at once throughout the whole length of the scoop, allowing the coal to fall through on the floor of the retort. It will put 336 pounds of coal into a retort 20 in. by 16 in. by 10 ft. Sixteen inches height in the retort is requisite for the use of this machine, if a heavy charge is desired. It works admirably, charging faster than the drawing machines can draw, and puts in the coal better than it can be done by hand. It requires a flat-bottom retort.

The Foulis machine has been used for many years at two stations in Manchester. It has until lately labored under the great drawback of having no arrangements for mechanically filling the scoop. It has been seen, however, that this is a necessity to its further use; and experiments are just about to be entered upon at the Gaythorne station in Manchester for breaking the coal and filling the scoops by machinery. When this is done its economy can be better compared with the other machines. It works quietly and efficiently—the two machines drawing and charging at the rate of 60 retorts in 40 minutes. The scoop used is connected with the end of a piston-rod worked by hydraulic power. It is of the shape of an ordinary scoop, and is run into the retort, turned over, pulled out upside down, and turned back again when withdrawn. It requires 15 inches height to work in, and less repairs than the West machines used at the other Manchester stations. It was arranged at Manchester to put about 275 pounds of cannel into a retort 22 in. by 16 in.

In spite of the successful working of these machines, there were two large English stations where the engineers preferred to use the Ross stoking apparatus, both for drawing and charging. As regards the drawing machine, there is no doubt about its giving satisfaction. The charger, however, has received much more criticism. It may be of interest, however, to this Association to hear that it is well liked where used abroad. Its most radical defect, and one requiring remedy, was its defective boiler power as furnished by the contractors. The engineer of the charger, to do good work, ought to have a boiler sufficiently large to enable him to work without seriously impairing his pressure; otherwise it is impossible for him to accurately measure his work. If his steam gauge remains tolerably level, and his coal is even in size, the machine will work fairly well. In Birmingham, where Midlands coal was used, which ran both lumpy and fine, it was impossible to do such good work as in London, at the Nine Elms station, where the coal was from Newcastle and contained few lumps of any size. In my judgment it would be equally so with Youghiogheny coal when using this machine, unless a breaker is used for the coal; but if it is, and ample boiler power furnished, the accounts which I received were certainly satisfactory, though it cannot be said of it that it will lay the coal in the retort as evenly as the other two machines. It can be used with flatter retorts than the others, and can give a charge of variable weight; while the others require a certain height for the scoop to work properly, and the weight of the charge is also restricted to the scoop's size.

Besides the three machines which I have briefly described there is also one which was the invention of Mr. Rowland, of Greenpoint, L. I., and which was in successful operation in the New York City Gas Company's works. He has since changed it materially, and has constructed one for the Boston Gas Company, which we hoped to have started long since, but which circumstances have interfered to prevent our using. It was contracted for before my visit to the other side (which I made this summer), and all the arrangements for breaking, elevating, and carrying the coal throughout our new retort house have been completed this season—some changes in the original plant having been found necessary. It is a combination of steam and hydraulic power, and will be tested thoroughly this winter.

To sum up the results of my examination into the subject of drawing and charging machinery, I can only say this—that I have no doubt it would pay to use a drawing machine in works where sixty retorts were habitually drawn in a row; and a charging machine for works of double that size. Perhaps that number is set too high; but it is possible that I have not made sufficient allowance for the daily trivial expenses, which amount to so little singly and so much when added together. This restricts their economical use to good sized works undoubtedly. If it be determined to introduce them, however, I have shown that there are various ways in which the problem has been successfully solved, and a choice can be made according to circumstances and the individual preferences of the company's manager. Improvements are being constantly made, and it would be a mistaken policy, in my judgment, to erect a large coal gas station at the present day without arranging for the introduction of each kind of machine.

Discussion.

The President—We have listened to a most interesting paper, and I hope the subject will be well discussed. I notice that Mr. Fullager, of the Cincinnati (Ohio) Gas Company, is present. As he probably has had more experience than any other engineer in this country in the use of charging and drawing machines, we would like to hear his experience.

Mr. Fullager—I did not hear the paper read, and therefore am not prepared to discuss it. I can say we have a drawing machine at our West Station which has been working steadily for three years. We required to have a charging machine there also, on account of increasing the weight of the charges to 260 pounds per retort. We have a charger at work in the new station. The retorts in that station are 20 feet through retorts. We draw from each side, and can draw at the rate of one a minute. We are working eighty retorts, forty on a side. We draw 15 the first hour, 10 in the second, and 15 in the third. We have not yet been able to give what would be the results from the charging machine. Up to the present time the machine has worked most satisfactorily, although some drawbacks happen occasionally; but these may be traced to our comparative infamiliarity with them. I have no doubt that we will master them completely in a short space of time. The drawing machine was a success from the very start. It will pay a company operating six or eight benches to put in the drawing machine. Any company with a daily output of from 1½ to 2 millions cubic feet will find it profitable to put in each class of machine. Even if you do not always use them their presence acts as a check upon the men. The men know, as long as the machines stand ready to be put in operation, that manual labor can be dispensed with. The drawing machine alone will save the labor of two men per day, and an equal number at night. We make that labor saving on ten benches of eights. Three men and an engineer handle the five benches. We charge 310 pounds every four hours. We are able to charge 420 pounds in five-hour charges. It is easier for the men, while we obtain the same results.

The President—Do you find through retorts to work better than single retorts?

Mr. Fullager—They enable the machine to work better; the coke does not pack up at the back.

The President—What about charging? Do through retorts favor that?

Mr. Fullager—Yes; the charge does not pack up against the back of the retort. I think through retorts are preferable to single ones where stoking machines are employed.

Mr. Littlehales—I would ask Mr. Greenough's opinion in regard to the smallest size of plant in which a charging machine could be profiitably worked.

Mr. Greenough—My opinion agrees with that of Mr. Fullager. I think that where a stack of sixty retorts is operated it will pay to put in a drawing machine. I believe Mr. Fullager thinks it will pay in works with fifty retorts.

On motion of Mr. Wood a vote of thanks was tendered to Mr. Greenough.

[To be continued.]

Safe Sea-Carriage of Coals.

According to the London *Colliery Guardian*, a case recently heard at the Court of Sessions is one of immense interest to coal owners. It brought to the fore again the momentous question as to whether coal can be safely carried long distances over sea. The case was heard by Mr. Commissioner Rothery, who had three nautical assessors to assist him. The ship Cilurnum left the Tyne in June last with 1,600 tons of Cowpen steam coal, and a few tons for the ship's use, and with 1,000 tons of other cargo. 1,400 tons of the coal was stowed in the lower hold, with pig iron and coke. The coal reached

from the mizzenmast to a little abaft the foremast, and the remainder of it was stowed in the after part between decks with part bricks. There were also two iron ventilators on each side of the forecastle, extending through the 'tween decks to the lower hold, and these are fitted with cowles. On the 17th of August smoke was reported issuing out of No. 1 ventilator, but no fire was then suspected. A smell of chemicals, however, continued; rain came on, compelling the closing of the hatches; and an explosion followed which blew up the greater part of the decks, killed a man, injured several others, and the vessel went down. The coal consisted of 924 tons from the low-main seam of Cambois colliery, and 704 tons from the yard seam of the Cowpen pit. Authorities in the north, and Mr. Willis, Government Inspector, showed that there was a small quantity of pyrites in the Cowpen seam coal. The master, chief mate, and second mate of the vessel also gave evidence, and Captain Steinson stated that he had been counselled by the owners, Messrs. Hall, respecting the ventilation, and he had had the fore and aft ventilating shafts plugged up and the connection severed. He disapproved of through ventilation. He thought it might have been better had the vertical ventilators been done away with, and ventilation only been secured from the surface; but the ship carried coal to Hong Kong, and this showed that it was not dangerous. The court found that the coal contained a very small quantity of iron pyrites, which, according to the Government Inspector, if properly cleaned, was quite fit for the long voyages. They had no reason to think the coal was not properly screened and cleaned. Every care seemed to have been taken, and the rule of the owners, that it should only be shipped in fine weather had been observed. They found that the fire had originated in the body of the coal and caused an explosion. The verdict, in short, freed the colliery owners from all blame. The question is to be answered, how did that fire begin? We may point out that chemicals have before now aided in the explosions aboard ship, and that strong smell of chemicals found by the crew of the Cilurnum would indicate that something of the kind occurred aboard that vessel. In the case of the Empress, of Hull, which occurred about two years ago, the hold of that vessel contained coals and bags of sulphate, etc. The coals were Yorkshire sorts of a well-known non-gaseous kind. Water, as in the case of the Cilurnum, got into the hold. There was an agreement of opinion that the mixture would prove sufficient to cause non-gaseous coals to evolve gas freely, and to lead to explosion. There is something feasible in thinking that something of this kind may have caused the recent disaster. This would urge the necessity in future of separating coal from chemical cargo. The court found that the ventilation of the Cilurnum was not of the very best character; but, as a matter of fact, that vessel was considered a safe one, and was as well appointed as many hundreds now afloat. Deck ventilators simply contribute to drench the cargo, and to lead to possible disaster. The matter of ship ventilation is still a serious question, when ventilated vessels sink to the bottom from explosions, while non-ventilated sail in safety.

ITEMS OF INTEREST FROM VARIOUS LOCALITIES.

A New Gas Company.—The well-known engineering and contracting firm of Messrs. G. B. & W. F. Inmann, whose headquarters are in New York city, have recently completed the erection of a water works plant in the town of Fort Madison, Iowa. When the franchise was originally secured the grant included the right to operate a gas works also; but it was thought the latter permission would not be availed of for some time to come, since the residents of the place appeared to be rather firm believers in the efficiency of gas machines and kerosene. With the completion of the water works, however, some of the more progressive spirits of the place suggested that, as Messrs. Inmann had made such an excellent job of the water system, they had better be called upon to erect the gas plant without further delay. A canvass of the people caused the contractors to view the suggestion with favor, and Mr. Clement A. White (who had charge of the water works construction) is now busily engaged in superintending the erection details of Fort Madison's gas plant. Fort Madison is the capital of Lee county, Iowa. It is located at a point on the Mississippi river 19 miles southwest of Burlington, and is reached by the Burlington and Southwestern and Burlington and Keokuk railroads It has a population of about 4,800.

The Port Chester (N. Y.) Opposition Company.—Greatly to the surprise he people of Port Chester, a gang of laborers recently commenced excavating the streets of that place for the purpose of putting down mains intended to form part of the plant of the Citizens Gas Company—an opposition concern, a charter for which was granted by the local authorities something over a year ago. The owners of the Citizens' franchise have, it is understood, been anxious to dispose of their "rights" to the managers of the old Port Chester Company; but the latter were not willing to be blackmailed, and declined to "buy out" their would-be antagonists. In view of the fact that the spring and summer seasons of the year were allowed to pass by without any attempt being made at plant construction, it would seem as though the present move is merely an attempt at "bluffing" on the part of the opposition manipulators, although they claim to be in earnest, and assert that they have purchased five acres of land in the vicinity of the Rye Railroad depot whereon to place the necessary buildings, etc. They also announce their intention of not only placing pipe in the town of Port Chester, but will extend the system to the adjoining precincts of Rye, Harrison, and Mamaroneck. A Mr. Olney—presumably of Brooklyn, Bayshore, Babylon, *et al.*, fame—is the "engineer" of the Citizens Company scheme; and, from all that we can hear about it, the entire proceeding possesses a decidedly fishy appearance—scales, smell, and all. The people interested in the old Port Chester Company have large real estate holdings in the neighborhood, and may safely be counted upon to make it warm for Mr. Olney and his backers.

Will They Secure a Foothold?—For some time back a certain set of speculators have been casting envious glances at the district now occupied, and occupied with credit, by the Northern Liberties Gas Light Company of Philadelphia, Pa. The particular cognomen selected by the enviers to distinguish their "individuality" from that of other operators in the same particular branch of industry, is this suggestive one—the Economy Gas Company. We have heard it hinted that the band might possibly be possessed of economy in one direction—that it was rather economic in the matter of honest business principles; and the hint is borne out somewhat strongly by the initial method of procedure—which, however, in no manner differs from the stereotyped form pursued by others of the raiding class. The first step was to interview the managers of the Northern Liberties Company, in the attempt to induce the latter to either sell or lease their plant to the newcomers. [Right here we cannot forbear from alluding to the stupidity or cowardice (it must, in plain terms, always be either one or the other cause) of shareholders who give up their works to these wreckers in consideration of an "interest guarantee." If the marauders can make money out of your property, what is to prevent or hinder you from making money out of it? Can it be possible that their business talents are so greatly superior to your own; or are you prepared to confess that their acumen only commences at the point where your's terminates? And, again, what earthly value can attach to their "interest guarantees" when the pinch really comes?] Failing in the attempt to convince the Quaker City company's shareholders that they did not know how to manage their own property, the Economy manipulators appeared before Councils and petitioned the Aldermen for a franchise to operate an opposition works in the coveted district. As to the action taken by the authorities thereon we have not yet been advised; but, judging from the knowledge of gas matters possessed by the Philadelphia City Fathers, there is reason to hope the Economy scheme will be negatived. A recent issue of the Philadelphia *Record*, in commenting upon the Economy petition, said: "By their fruits ye shall know them. In other cities the speculators have preyed upon investments in gas works and upon gas consumers. What reason is there to expect any better treatment in Philadelphia?" To which we would reply, "None in the slightest."

Trouble over Street Lighting at Pittsburgh, Pa.—The street lamps in the East, West and South districts of Pittsburgh have been lighted by the East End Gas Company, but the contract under which Mr. Denniston operated terminated on November first. In the meantime the city Councilmen had granted a three-year contract (commencing with date of Dec. 1st, 1885) for the lighting to the Pennsylvania Globe Gas Light Company, which only awaited the Mayor's signature to become binding on the city. The Mayor, however, refused to affix his signature to the document, and as the veto would not come before the Councilmen until their meeting on the evening of December 4th, it looked like as though a great portion of the city would be left in darkness. Supt. Denniston did not know exactly how to act; but Controller Morrow told Mr. D. to go on with the lighting as formerly, and the city would pay the bills in accordance with the terms of the contract under which the East End Company performed the work. In this way Pittsburgh's streets were kept from darkness; but we submit it seems rather queer that the Pittsburghers should elect to light their streets with a gasoline or naphtha illumination—for such is the material employed by the Globe Company.

The Natural Gas Flow was Weak.—The Allegheny County (Pa.) Electric Light Company's station, on Virgin street, Pittsburgh, was compelled to suspend operations on evening of November 30th on account of scarcity of the natural gas supply. Several complaints about an inadequate fuel supply have recently been made by those depending on the natural gas commodity for the working of their factories, etc.

Retaining the Arc Lights on the Bridges.—The Edison Illuminating Company, of Lawrence, Mass., having been awarded the contract for lighting the public lamps of that city under the incandescent plan, naturally enough concluded such permission or award gave it the right to replace the arc lamps, formerly in use on the railroad bridges crossing the Merrimac

river, with those of its own description. The Lawrence Electric Light Company (arc system) contended against the proposition, and the matter was referred for settlement to the Streets Committee of the Board of Aldermen. The Committee, after due notice, gave a public hearing to those interested, and the general sentiment appeared decidedly favorable to the retention of the arcs; but, on the other hand, the testimony advanced at the Committee's session must go far toward throwing discredit upon the incandescent plan of illumination as at present practiced in the lighting of the city's streets. What is claimed to be a valuable and superior lighting agent for the streets ought to be adequate enough to light the bridges. Still it seems not to be so at Lawrence. One objection offered against the arc lights was to the effect that they were extinguished at too early an hour—*i. e.*, "early for morning"—the current being shut off at midnight; but this appeared to have been negatived by the plea of a certain Mr. Jno. Campbell, taxpayer, who thought "twelve o'clock was the proper time to extinguish the lights; for those persons out after that hour, as a rule, were in no fit condition to be seen." At any rate, the deliberations of the committeemen resulted in a unanimous ballot to recommend that "the arc lights now in use on the bridges, and common to the city government, be retained." The charge made by the Lawrence Electric Lighting Company for maintaining each arc in action until midnight is ten dollars per month—a pretty stiff price, by-the-way.

Cheaper Gas for Columbia, Pa.—Mr. Robert Beacham, of the Columbia Gas Light Company, writes us that a reduction in selling rates was made by his company on date of Oct. 1st, 1885. Those using over a certain monthly quantity are charged at the net rate of $2 per thousand; consumers in the lesser grade obtaining their supply at the figure of $2.50 per thousand, subject to a discount of 10 per cent. if bills be paid on or before the expiration of 15 days from rendering of account. The former net prices were $2.25 and $2.50 respectively. Keep it up, Mr. Beacham.

Price of Gas Reduced at Grand Rapids, Mich.—The Messrs. Gilbert, of the Grand Rapids Gas Light Company, once more report the right sort of progress, and the following is evidence that they are believers in the efficacy of low selling prices. The new plant of the company was put into successful operation on the 23d day of last Oct., or just in time to relieve the management from the unpleasant predicament of being forced to acknowledge their inability to supply the demands of their patrons. The inauguration of the new plant was made the occasion for announcing the following schedule of prices, the scale to take effect on consumption registered from first day of 1886:

To consumers of 10,000 cu. ft. per month, net price			$1.30 per M.
Between 5,000 and 10,000 "	"	"	... 1.50 "
" 1,000 and 5,000 "	"	"	... 1.60 "
Less than 1,000 cu. ft. per month		"	... 2.00 "

The above is certainly the cheapest sort of a schedule when one bears in mind the distance separating Grand Rapids from the rich gas coal basins. We do not believe, however, that "bottom rock" has been reached there yet, as the Messrs. Gilbert freely confess that the steady reduction made by them in gas rates during the past six years has been the means of increasing their business in a really wonderful manner. We congratulate them upon a success fairly and honestly earned.

Cheaper Gas for Elkhart, Ind.—Mr. Geo. T. Murdock, Sec. and Supt. of the Elkhart Gas Light and Coke Company, forwards the information that on and after January 1st, 1886, the discount granted to all classes of consumers will be increased to 50 cents per thousand cubic feet. This brings the net rate down to $2. The discount is applicable only to accounts that are settled within the first twelve business days of the month. The Elkhart gas men evidently are not sleeping at their posts.

Proposing to Remove Trustee Clarke.—Messrs. C. R. Cummings, S. A. Kent, and W. S. Reyburn, who are holders of several thousand dollars worth of the first mortgage bonds of the Consumers Gas Fuel and Light Company, of Chicago, Ill., have called a general meeting of the bondholders of that corporation, the principal purpose of the convention being to agitate the question of the removal of Mr. Dumont Clarke from his position as mortgage trustee. The advertisement of meeting reads in this way: "* * for the purpose of submitting to the holders of said first mortgage bonds the question of the removal of Dumont Clarke as such trustee, and such other matters as may be proper for such bondholders to act upon." Judging by the present standing of affairs, the meeting ought to be a prolonged one, if "all such other matters" are to receive a fair share of attention. The meeting is to be held at the Company's office, No. 94 Dearborn street, at noon of December 19th.

Street Lighting Matters at Hillsboro, Ohio.—The ten-year contract between the authorities and gas company at Hillsboro, as to the lighting of streets, has expired; and it appears as though a hitch would occur over the terms to prevail in future. Under the old contract the gas company received $31.50 per annum for each street lamp, and was also allowed to charge private consumers at the rate of $3 per thousand cubic feet. The Council has submitted a proposition to the gas company, under which the city agrees to award the former a contract for a term of years if it will accept as compensation $12 per annum for each street light, and agree to charge but $1.50 per thousand to private consumers. Of course, the figures submitted by Council are ridiculously inadequate, and there is no reason to suppose that the company would consider them seriously for a moment. It goes without saying, however, that the old prices are also outside of reason now; and we may express the hope that each party to the contract will see the necessity of making concessions. How would $22.50 per annum for lamps and $2.10 per thousand to private consumers suit? In the meantime the agents of the Thomson-Houston electric lighting system are endeavoring to induce the Council to try the arc plan of street lighting; but, should such consent be given, before long the authorities would have occasion to regret that they did not conclude a contract with the Hillsboro Gas Company even at the price of $31.50 per lamp. Perhaps some of our Hillsboro friends will kindly let us know something about the conclusions finally arrived at.

An Analysis of Natural Gas.—Col. F. W. McCarty furnishes the following figures concerning the composition of the natural gas issuing from the well discovered by the National Tube Works Company on its premises, at McKeesport, Pa.:

Marsh gas	94.09
Free hydrogen	2.90
Carbonic oxide	1.02
Olefiant gas	.94
Oxygen	.74
Carbonic acid	.06

Col. McCarty—who spent a number of years in the Russian petroleum and natural gas regions, in the vicinity of Baku, where he successfully applied the natural fuel product to the heating of boilers, etc.—is an enthusiast on the possibilities of the Murraysville wells. These, he believes, will last forever. Perhaps so, Colonel; but it rather looks as though the flow had already exhibited symptoms of weakness.

Natural Gas Discovery near Washington, D. C.—A despatch, dated Dec. 1st, says that workmen engaged in sinking a drill, for the purpose of determining whether the foundation for a proposed sluice gate could be sunk in the river at a point about 2,000 yards distant from the Washington Monument, were somewhat surprised over encountering a vein of natural gas. The flow was rather weak. The gas possessed a very bad odor, and burned with a flame color not unlike that given off by ignited alcohol. Col. Haines, engineer in charge of the Potomac River improvements, will make further investigations.

Killed by the Electric Current.—Jas. W. Prashka, engineer at the electric lighting station, corner of Fourth street and Mitchell avenue, St. Joseph, Mo., on the evening of Nov. 16th, was found lying beside the dynamo machine as though life were extinct. He was at once removed to his home, and medical attendance given him. The physicians were powerless, as Prashka never recovered consciousness. No explanation (other than that deceased had been prostrated by an electric shock) can be given, as the victim happened to be alone in the room when the accident occurred.

Electric Light for Troy, N. Y.—According to the Troy *Daily Telegram*, it now looks as though the streets of Troy are to be lighted under the arc system. At the meeting of the Common Council, Thursday, Dec. 3d, Ald. Riley moved that the contracting board be directed to "cause a sufficient number of electric lights to be located to light the whole city, the location of poles and lamps to be under supervision of city engineer." This proposition did not, in all particulars, meet with favor from Ald. Cridge, who moved an amendment to the effect that "the lights be suspended over middle of the crosswalks." Alderman Riley, rightly believing the difference to be only that supposed to exist betwixt "tweedle-dum and tweedle-dee," gracefully accepted the amendment, and, "as repaired," the resolution was adopted. We suppose the Mayor will have something to say about the Riley-Cridge innovation in public lighting at Troy; and, if that august official is not concerned in the "job," perhaps he might be wise enough to veto the scheme.

The National Tube Company Assuming the Role of a Benefactor.—In an "item" given elsewhere we speak of Col. McCarty as an enthusiast on the subject of natural gas; and we must now include his employer and patron (Mr. J. H. Flagler, General Manager of the National Tube Works Company) amongst the lists of public benefactors—that is, benefactors according to their way of thinking. The enthusiastic military man has been

engaged in making experiments in the direction of carburetting the natural product up to the point where it could become a satisfactory substitute for ordinary gas as employed for domestic purposes, and the Col. believes he has succeeded. The Tube Company's wells furnish a flow far in excess of that required to meet the fuel needs of the establishment, and when Col. McCarty had convinced Mr. Flagler that the carburetting process was a thing accomplished, the latter gentleman, in the goodness of his heart, asserted that McKeesport's inhabitants should enjoy the boon of "cheap high-power gas." Mr. Flagler, however, proceeded with caution, and at first suggested to the managers of the McKeesport gas company that they had better buy their supply from the Tube Works' wells. Sec. Davitt, of the gas company, offered to try the McCarty mixture under certain conditions; but as the latter did not quite, or even nearly, meet the pecuniary estimates of benefactor Flagler, the "Tube Works man" avows his intention of "piping McKeesport on his own account." Of one thing we are quite certain; and that is this: If trained gas engineers like Messrs. Denniston, McElroy, and others could not make a success out of natural gas, in its application to ordinary lighting uses, Col. McCarty need not be looked upon as the one to succeed where they failed—despite the fact that the Col. spent many years in the Russian gas territory.

And Still the Testimonials Come.—Reference to our advertising columns will disclose an entire new batch of testimonials certifying to the accurate manner in which the "Connelly Automatic Governor" does its work.

An Item or Two from Toronto, Canada.—An opposition clique is endeavoring to effect an entrance into Toronto. Mr. Pearson's straightforwardness in the past will likely have the effect of keeping out the marauders. It may also be noted that the people are greatly dissatisfied over the electric lighting of their city. The contract calls for the supply and maintenance of lights having a power of 2,000 candles; but the average of several tests, made by independent observers, shows the power of the lights to be not over 400 candles. The gas company has recently placed 9 handsome specimens of the Lambeth lantern at different points on Queen street. The burners in these lanterns each develop a light equal to 150 candles, and their effectiveness is most favorably commented upon.

The Death List.—"Terrence Curry, a farmer, of Johnstown, N. Y., came with his 17-year old daughter, on Tuesday, to visit sanitary policeman Pitkin, at No. 93 Perry street. His daughter remained there all night, while he went to the Clinton Place Hotel, Sixth avenue and 8th street. He blew out the gas, and was found dead in bed yesterday."—N. Y. *World*, Dec. 3.

Another Addition to It.—"Balt., Md., Nov. 29.—Yesterday morning Mrs. Gothan Lowenthal, aged 75 years, was found unconscious in her room, in the northwestern section of the city, and the apartment filled with gas which had escaped from a burner partially turned on."—Phila. (Pa.) *Record*, Nov. 30.

Correspondence

[The Journal is not responsible for the opinions expressed by correspondents.]

Is It a Harmless Anæsthetic?

Poughkeepsie, N. Y., Dec. 1, 1885.

To the Editor American Gas Light Journal:

In your issue for November 16th appears a communication from Mr. A. L. Allen, of Poughkeepsie, N. Y., in which that gentleman presents his views regarding the non-poisonous qualities of carbonic oxide, and also refers to its "exhilarating" effect upon the animal system. It appears to me that these claims are put forward at rather too late a date. The question of the poisonous nature of carbonic oxide, as far as the opinions of eminent chemists and distinguished physicians are concerned, would seem to have been definitely settled long ago. Leading authorities are unanimous in their decision that carbonic oxide is a poison of the most virulent character; and it may be added this determination is concurred in by chemical experts of all civilized countries. As reported in your columns, Profs. Sedgwick and Nichols, of Massachusetts, not long since detailed the result of experiments made by them (at the instance of the State Health authorities) with this gas. Its deadly effect is truthfully and strikingly shown by the researches of these gentlemen. Not the least important evidence presented is that which shows the small quantity of gas required to be inhaled to produce fatal results. Their conclusions verify those of MM. Leblanc and Dumas, who long ago explained that air containing one per cent. of carbonic oxide will kill a dog in 1½ minutes; and that birds die instantly in an atmosphere containing 5 per cent. of it. Dr. Letheby found that air containing one-half per cent. of the gas killed birds in five minutes; whilst if air carried one per cent. a fatal result was reached about twice as speedily. He says that an atmosphere containing 2 per cent. rendered a guinea pig insensible. The animals fell down insensible, and either died at once—with a slight flutter hardly amounting to convulsion—or gradually slept into death, as if infected with a profound coma. The Dr.'s conclusion was that "carbonic oxide is, in short, a pure narcotic poison."

The opinions above quoted, in so far as they show the true nature of this gas, have been amply verified by what has happened in this country since water gas has been commercially supplied. In the metropolis alone 86 deaths are recorded as having occurred from inhalation of the fatal vapor, and 49 cases of suffocation are also upon the register—many of the latter have no doubt terminated fatally. I submit this, of itself, furnishes all the proof requisite to refute Mr. Allen's "harmless anæsthetic" plea.

The gentleman also states that he purifies 113,000 cubic feet of gas with the aid of one bushel of lime. Are we to infer that that is all the material employed by him in his purifying boxes? To what purpose, then, is the oxide of iron and vitriol received by his company applied to? He claims that the electric light company, after six months' of canvassing, has only placed 15 of its lights amongst the patrons of the Citizens (Allen's) Company, while over 50 have been distributed in the Poughkeepsie Gas Company's district. What are the facts? Investigation develops the following:

In the Poughkeepsie Company's district 53 of its patrons employ electric lights—three of these consumers are interested financially in the success or failure of the electric company; while amongst the Citizens Company's consumers 27 (instead of 15) may be found using electricity. Indeed—with a charge of but $7.00 per month per light, and lighting hours being from 4 P.M. to 10 P.M., it is matter for wonder that the "light of the future" has made such poor headway in the city of Poughkeepsie.

Since the advent of Mr. Allen and his *pure water* gas in this locality the usual changing about of consumers from one company to the other has been constantly going on; but still, the fact remains that the old Poughkeepsie Company has gained more customers than it has lost, which I take for granted is a good indication the gas consumers of the city are well satisfied with the commodity furnished by the managers of that plant.

Truly yours, M. A. C.

Does Mr. Thurber Own Stock in a Burner Company, then?

New York, ———, 1885.

To the Editor American Gas Light Journal:

My attention has been called to an article in your issue of November 16th, in which my name is mentioned in connection with the Gas Consumers' Association, and a statement made by Hon. Geo. W. Greene, of Orange county, that I was interested in a gas meter job, etc.; that the amendment offered by him to the bill in the Legislature last winter was rejected in consequence of my opposition; that Hon. S. T. Hopkins, of Greene county, stated that I had solicited him to take $10,000 stock in said meter company; that Mr. E. B. Harper, of New York, had also stated that one of my attorneys had solicited him to take $5,000 stock. I am not interested in any gas meter company. I do not know any such man as Hon. S. T. Hopkins, of Greene county, N. Y.; consequently never solicited him to take $10,000 stock in a new meter company. I do know Mr. E. B. Harper, of New York, who writes me that he never made any such statement as stated in the article in question. I did meet Mr. Greene on the train one day going to Albany, when he proposed an amendment (which I did not oppose), and I presumed that it would be offered in the Legislature at the proper time; but never heard of its being offered. These statements were circulated in Mr. Greene's district, but he was re-elected, although by a greatly reduced majority—the reasons for which are well known to both the gas companies and the Gas Consumers' Association. I have no personal feeling against Mr. Greene, notwithstanding the misstatements which have been circulated in his interest. The "History of a Legislative Shame," mentioned in your article, was made up from the letters and statements of unprejudiced newspaper correspondents, and others who were on the ground throughout the disgraceful scenes connected with the killing of the gas bills. These extracts tell their own story.

One of them wrote:

"To accomplish the defeat of the first bill there was more money used in the Legislature than since the time of the memorable Tweed regime, and whoever voted against the bill was justly regarded with suspicion of having received some of the money."

The New York *Evening Post* said:

"We doubt if there is an intelligent citizen in the State who does not know precisely what the cause was. The performance fixes the character of the majority of the Assembly as plainly as if a price mark had been affixed to their coat collars."

The *Mail and Express*, of May 11th, said:

"The citizens of the State, outside of its chief city, have no direct pecuniary interest in the fate of this measure; but they have a common interest in resisting the encroachments of monopoly and in preserving our institutions from the decay that is inevitable when corruption rules at the sources of political power."

This is the only interest I have in the matter; and if, after the facts are placed before them, political parties see fit to take the money of the gas companies and nominate and elect such men, I am sure that I can stand it if they can. It is an encouraging feature, however, for the political future of this country, and even for the permanent welfare of capital, that a majority of the members involved in the legislative corruption of last winter failed to secure a re-election. Respectfully, F. B. Thurber.

The Market for Gas Securities.

City gas shares have been somewhat neglected during the fortnight; but, generally speaking, values were well maintained. Consolidated shares enjoyed or experienced the usual sea-saw motion, having sold down as low as 97, and as high as 100¼. To-day (2 P.M., Dec. 14) sales were made at 100, and that figure may be given as the present ruling market rate. If the true inwardness of the quotations emanating from the regular Stock Exchange headquarters was exposed we venture the assertion that 75 per cent. of the sales reported as occurring below par in Consolidated gas represent the "washing" process. No possible combination of circumstances can occur that will prevent Consolidated shares from reaching 125 before the end of 1886. The Advisory Board of Equitable Company, of this city, have recommended that a dividend of 3 per cent. be paid to shareholders. Of course, there is nothing final in this, as the board of directors must confer, adopt and confirm the recommendation. It is likely that they will assent to the proposition. The new stock will not participate, since it is not yet "full paid." Mutual is strong; Equitable, old stock, shows no change. Brooklyn shares are inclined to weakness, save and except Metropolitan and Nassau. Washington (D. C.) stock is strong; the same remark applies to the old Chicago Company's shares.

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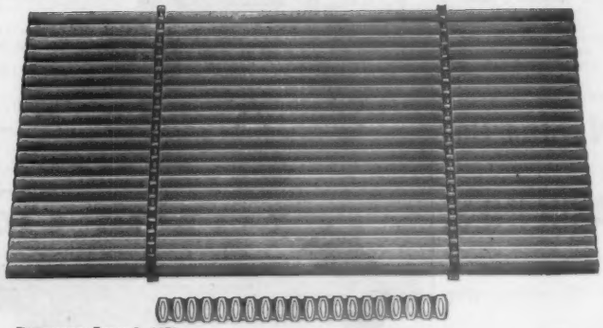

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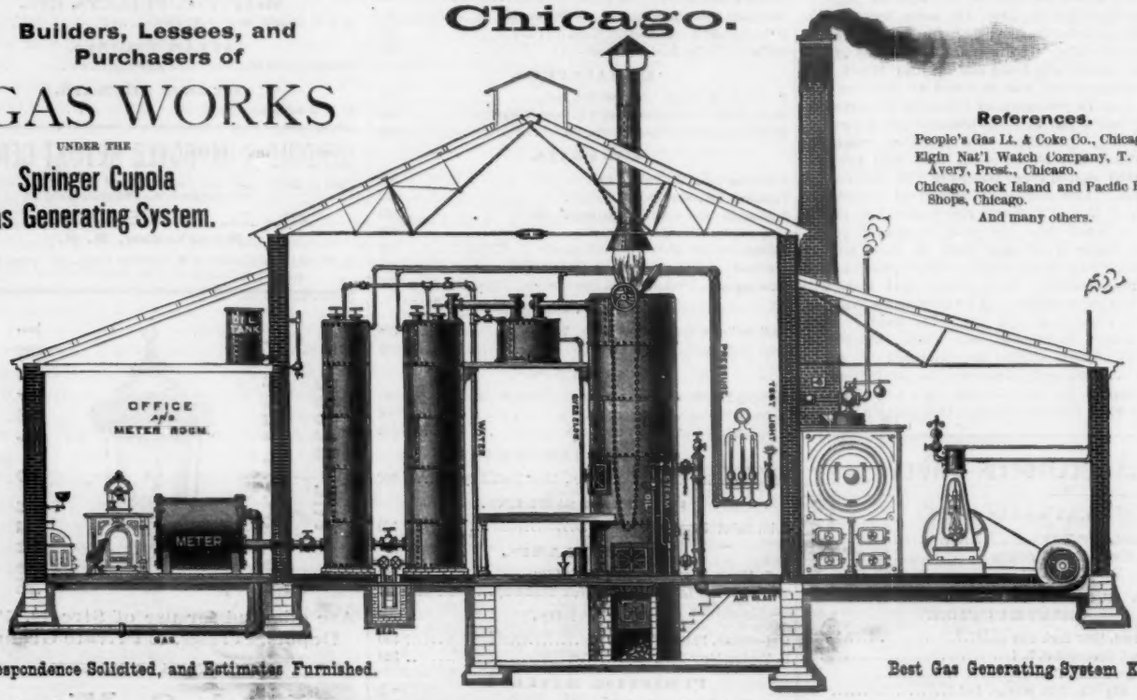

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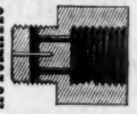

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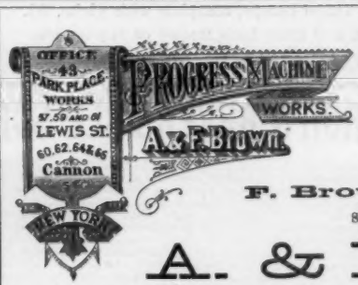

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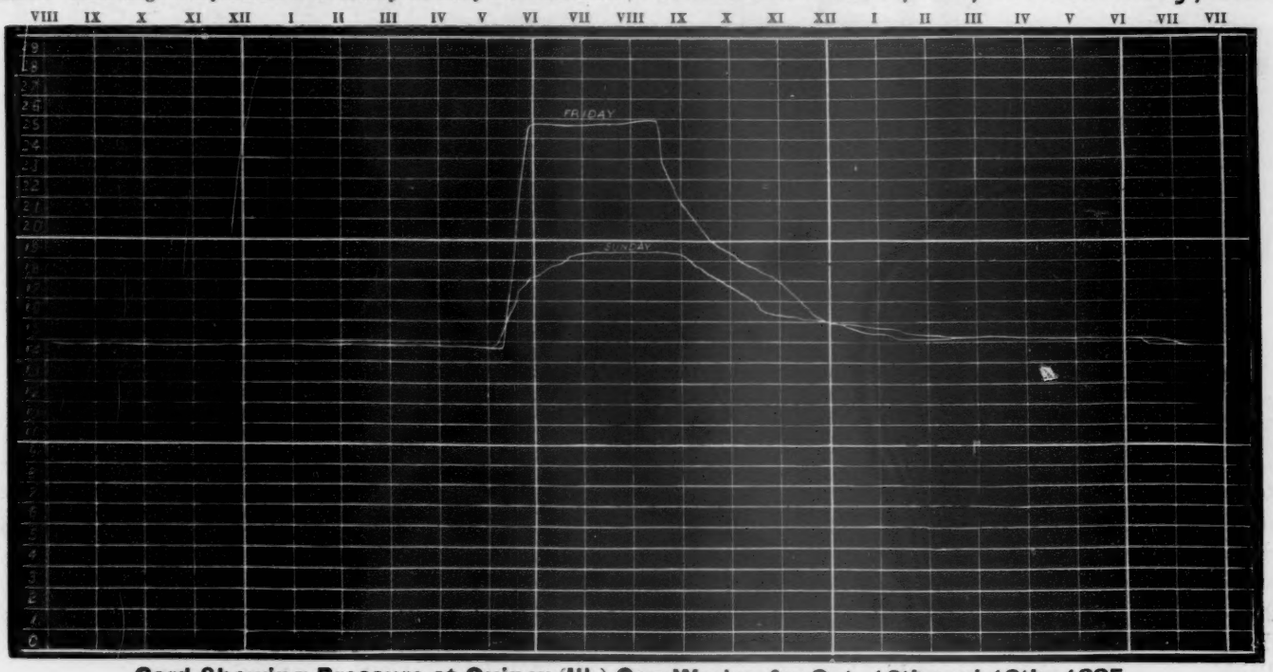
CONNELLY'S AUTOMATIC GOVERNOR FOR STREET MAINS.

We give herewith a few late letters from gas companies using our Governor, and also a cut (exact reproduction) of two pressure sheets from the Quincy (Ill.) Gas Works. A careful inspection of the cut will reveal more concerning the Governor's accuracy and reliability than we could express in all the columns of the JOURNAL. It shows clearly that the Governor is endowed with more than human intelligence, and fully verifies a late remark of a certain "Western Member"—"Connelly's Governor is *brains in iron.*" At Quincy the stores close early, and on all week nights excepting Saturday the Governor begins to reduce the pressure at about 8:30 P.M.; but on Sunday evening (when the consumption is so light that the Governor puts on only 19-tenths pressure) it is *one-half hour later* beginning to reduce—its action being the reverse of that followed by nine out of ten intelligent managers under the same circumstances or conditions. Although the consumption is much less on Sunday nights than on others, the volume per hour remains the same until 9 o'clock, when the church lights are extinguished. The Governor thus shows a finer discrimination than human intelligence is capable of. We do not boast of what our Governors "can" or "will" do, but submit evidence of WHAT THEY ARE DOING! We now have 43 of these machines in practical operation, and experience has taught us that a machine so delicate and sensitive in its construction, liable to be placed under such widely varying conditions, *cannot be perfected on paper.* Our late improvements enable us to send out a Governor to *any works*, capable of being adjusted to any possible conditions or requirements after it is in place. A 20-inch Governor can be sent to one works and adjusted to hold 3-tenths day and 40-tenths night pressure, and its duplicate or counterpart may be sent to another works having same consumption and initial pressure, and be set to hold 10-tenths day pressure and 11-tenths night pressure—both working perfectly as desired. Such range of adjustment is absolutely necessary in an Automatic Governor, not only to secure the desired action in the beginning, but to be prepared to meet the new conditions sure to follow the building of a heavier holder or a large increase in capacity of the mains. No Governor in this country or abroad, in use or illustrated on paper, is constructed with such a range of adjustment, and to secure it would require a radical change in principle.

Another important feature of our Governor *not found in others* is the *absolute impossibility of the valve sticking in its seat* and shutting off the gas. We do not permit the valve to *enter* its seat; it is so constructed that it bears at *right angles* on a knife-edge seat, and must fall away from it when its supporting pressure is reduced in the least degree. The great value of this feature will impress itself on the careful Gas Manager. In short, our experience has enabled us to meet every possible requirement in Automatic Governors (as the accompanying letters attest), and we can unhesitatingly guarantee every Governor sent out to give perfect satisfaction in every respect, or will remove same at our expense. It is useless for us at this late day to waste any words on the *economy* and *satisfaction* derived from such a machine; and no progressive Engineer or Superintendent would to-day plan a works without locating an Automatic Governor. As they are finely finished and highly ornamental, their proper place is in the Office or Meter Room. As one of these Governors will *save its cost* in a short time, no company should hesitate to place one. The more perfect distribution and satisfaction given consumers are additional advantages that cannot be estimated in dollars and cents. We publish below a few letters, and will publish others in the following numbers of the JOURNAL.

CONNELLY & CO., Ltd., 407 Broadway, N.Y.



Card Showing Pressure at Quincy (Ill.) Gas Works, for Oct. 16th and 18th, 1885.

Augusta, Ga.

OFFICE GAS LT. CO. OF AUGUSTA, GA., Nov. 28, 1885.

MESSRS. CONNELLY & CO.—Gentlemen: In reply to yours of 24th inst., we would say we have had your Automatic Governor in use about eight months. In that time it has always done its work well; it is no eye servant—it requires no watching; in fact, it is the only Automatic Governor that has ever come to my notice. Knowing its value as I do, I can honestly say I would not be without it if its cost was ten times as much. I look upon it as one of the very best investments I have ever made for my company.

Yours very truly, G. S. HOOKEY, Supt.

Greensburg, Ind.

GREENSBURG GAS LT. CO., GREENSBURG, IND., Oct. 17, 1885.

MESSRS. CONNELLY & CO., LTD.—Dear Sirs: In answer to yours of the 15th, I will say that we are well pleased with our Governor, and would not do without it under any circumstances. It "fills the bill" in every respect.

Yours, W. S. SMITH, Supt.

Lima, Ohio.

LIMA GAS LT. CO., LIMA, OHIO, Nov. 7, 1885.

MESSRS. CONNELLY & CO., LTD.—Gentlemen: In reply to yours of the 6th inst., would say that your Governor is giving entire satisfaction—doing all that you claim for it. Hoping this is satisfactory, I remain,

Yours respectfully, W. H. GIBSON, Supt.

Danville, Ill.

DANVILLE GAS LT. CO., DANVILLE, ILL., Nov. 9, 1885.

MESSRS. CONNELLY & CO.—Gentlemen: In reply to yours of 7th inst., I would say that I have had one of your Automatic Governors in use about two months. Since setting up and adjusting it has required no attention whatever except a little oil once a week. Thus far it has performed its work admirably, and always on time. Yours respectfully,

J. H. WOODMANSEE, Supt.

Bethlehem, Pa.

BETHLEHEM GAS LT. CO., BETHLEHEM, PA., Nov. 1st, 1885.

MESSRS. CONNELLY & CO.—Gentlemen: I wish to say to you that we are glad the delay occurred in the delivery of our Governor, inasmuch as you sent it with the new improvements added. It is a satisfaction to us to know that we waited exactly long enough before buying, and that we did buy exactly what we wanted. Yours very truly, A. H. RAUCH, Supt.

Frankfort, Ky.

CAPITAL GAS AND ELECTRIC LT. CO., FRANKFORT, KY., Nov. 9, 1885.

MESSRS. CONNELLY & CO., LTD.—Dear Sirs: Replying to your favor of the 7th inst., will say that we have been using one of your Improved Automatic Gas Governors for nine months, and find that it is just what it is represented to be—a perfect Automatic Governor. Respt. yours, S. J. SHEA, Supt.

Athens, Ohio.

ATHENS GAS LT. CO., ATHENS, OHIO, Nov. 9, 1885.

MESSRS. CONNELLY & CO.—Gentlemen: Your favor inquiring after the working of the Connelly Governor received. It has now been in use more than a year, and we find it as recommended in every particular. It does all the work required of a Governor, and strictly *automatically*. I have not the first disadvantage to suggest, after a trial at all seasons of the year. We consider this investment the most profitable and economical of any about our works, and have recommended it to all inquirers. Our leakage account has been reduced one-half. Yours very truly, C. H. WELCH, Supt.

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Highest Award American Institute, New York, 1883. Silver Medal American Institute, N. Y., 1884.
Gold Medal Awarded Crystal Palace Electrical Exhibition, London, 1882.
Highest Award for Motive Power British Section International Exhibition of Electricity, Paris, 1881.

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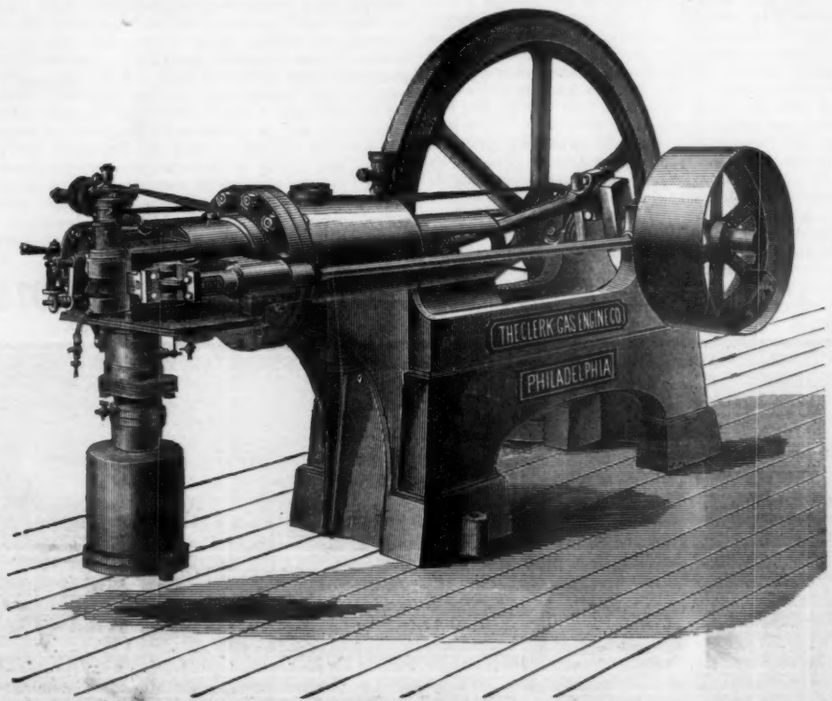

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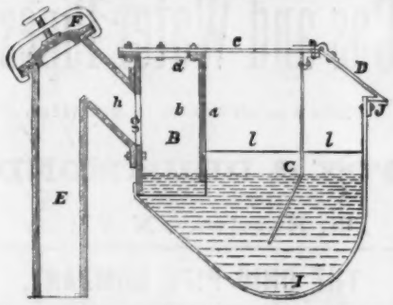

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For description, see AM. GAS LIGHT JOURNAL of Feb. 2, 1884.
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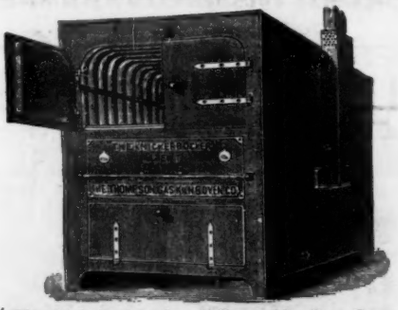

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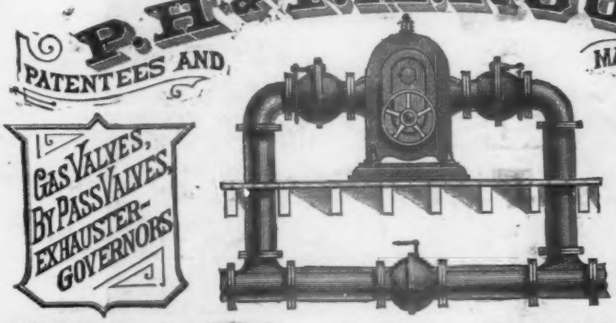

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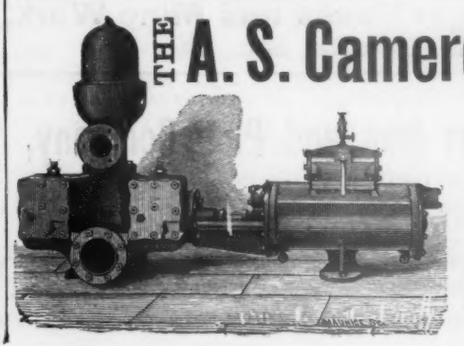

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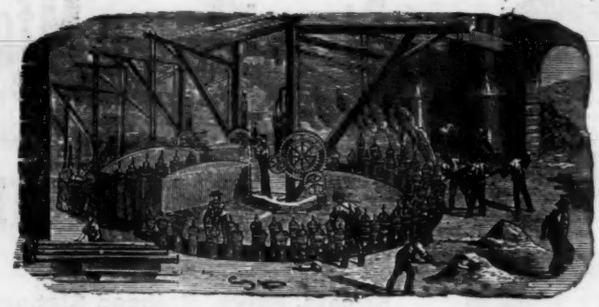

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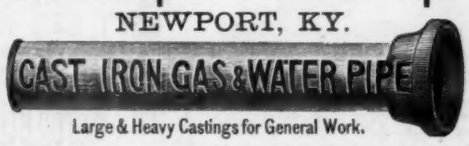

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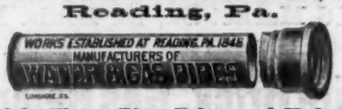

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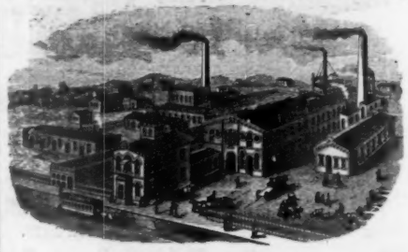

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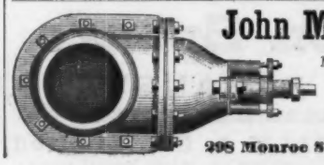

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1880	42,067,500 "
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Total	235,937,500 cubic feet.

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	Number.	Cubic Feet per Day.
Great Britain	151	157,070,000
Western Hemisphere	38	39,337,500
Australia	18	12,150,000
New Zealand	2	650,000
France	6	4,550,000
Belgium	8	5,420,000
Germany	16	8,200,000
Holland	4	4,160,000
Denmark	1	150,000
Russia	2	3,500,000
Spain	1	350,000
India	1	400,000
Total	948	235,937,500

THE CONTINUED POPULARITY

Of these Machines

Will be recognized from the following extracts from letters from representatives of some of the companies having them in use:

OFFICE METROPOLITAN GAS CO, N. Y. CITY.

We have had the "Standard" Washer Scrubber you furnished to us in action since August, 1882. The ammonia liquor derived from it has a strength of from 12 to 20 oz. Twaddle, and it works uninterruptedly and satisfactorily.

OSCAR ZOLLIKOFFER, Prest.

Dr. E. G. Love, official Gas Examiner for New York city, reported Metropolitan gas for quarter ending June 30th, 1885, as follows: Illuminating power, 25.04; ammonia, grains in 100 cu. ft., 2.46.

LACLEDE GAS WORKS,
ST. LOUIS, Mo. Nov. 25, 1884.

The "Standard" is performing its work to our entire satisfaction. It has passed and freed from ammonia 30 per cent. more gas than it was rated as being able to pass. The test paper shows not a trace of ammonia.

FREDERIC EGNER, Eng. and Supt.

"Standard" Washers Ordered Recently.

	Cu. Ft. per Day
Anneberg Gas Co	200,000
Bombay Gas Co	400,000
Brussels Co	1,250,000
CHICAGO, two, 1,000,000 each	2,000,000
Chemnitz Gas Co	1,000,000
CITIZENS GAS CO., BUFFALO	750,000
Coke Works in Zabre, Ober-Schlesien	1,500,000
Cokerei der Friedenshutte, Upper Silesia	600,000
Dumfries Corporation	250,000
Dunedin Gas Co., New Zealand	400,000
GEORGETOWN, D. C	250,000
King's Lynn Gas Co	300,000
Leiden, Holland	600,000
Lincoln Gas Co	400,000
Liverpool Gas Co	2,000,000
" "	3,000,000
LOUISVILLE GAS CO	1,500,000
MUTUAL GAS CO., BUFFALO	750,000
MINNEAPOLIS GAS CO	1,000,000
Numea Gas Co	100,000
PITTSBURGH GAS CO	1,500,000
PAWTUCKET, R. I	500,000
PORTLAND GAS CO., Oregon	562,500
SAN FRANCISCO GAS CO	4,000,000
Sheepbridge	40,000
ST. LOUIS GAS CO	2,000,000
Sydney Gas Co	2,500,000
WASHINGTON, D. C. GAS CO	2,000,000
Whitehurch Gas Co	175,000
Total	29,677,500

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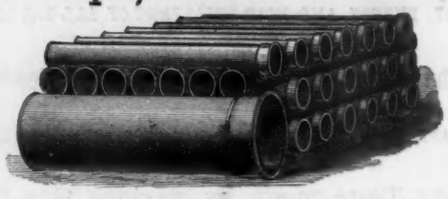

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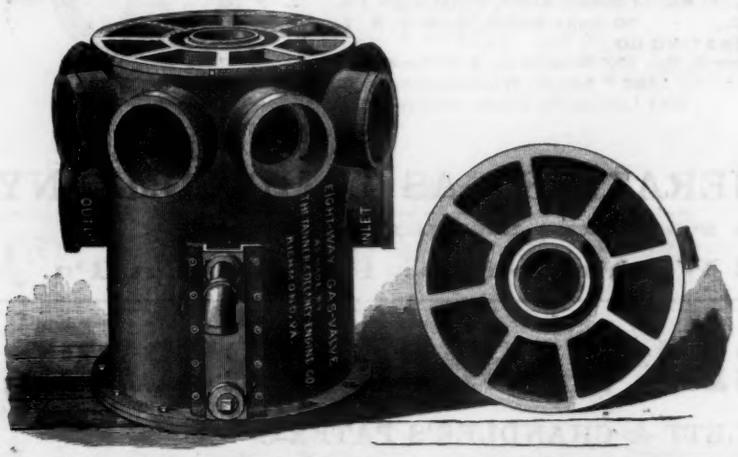

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Akron, "	"	80,000 "
Xenia, "	"	10,000 "
Adrian, Mich	"	65,000 "
Ypsilanti, Mich	"	25,000 "
Muskegon, "	"	70,000 "
South Bend, Ind	"	70,000 "
Anderson, "	"	20,000 "
Plainfield, "	"	10,000 "
Springfield, Illinois	"	100,000 "
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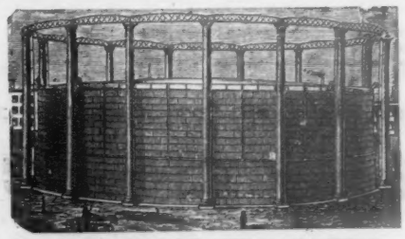

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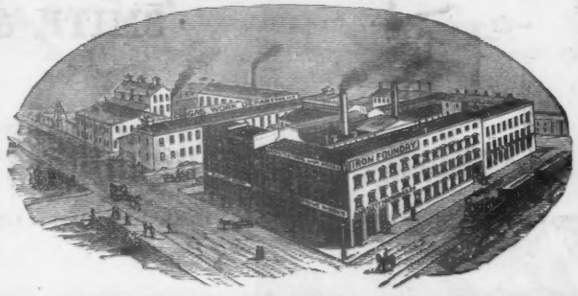

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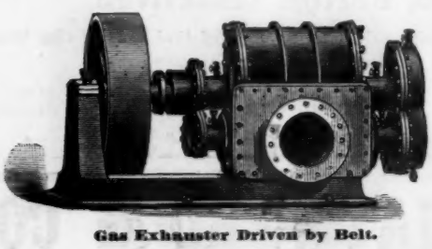

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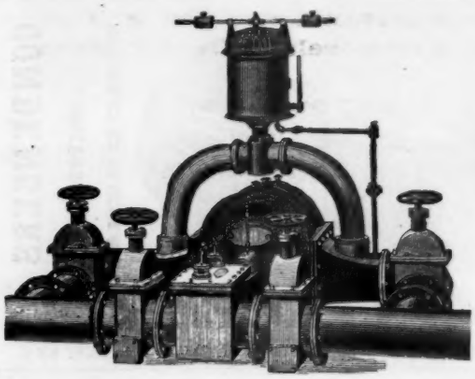

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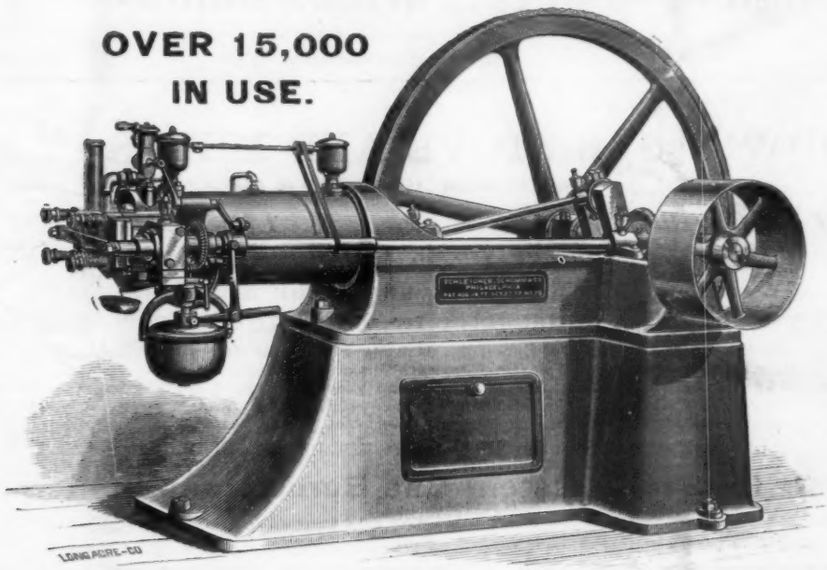

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